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GINGER.

By J. Ch. Sawer, F.L.S.

THIS very widely-used aromatic is furnished by the roots of the *Zingiber officinale* (Roscoe), an Indian herbaceous plant, with creeping jointed, woody root-stocks, from which are sent up every year stems surrounded by sheathing leaves arranged in two ranks. Its cone-shaped spikes of flowers are thrown up from the root-stock. The plant is largely cultivated both in the East and the West Indies; also in Africa (Sierra Leone) and in Queensland (Australia). The so-called Chinese and Siamese gingers are identical, but both of them are the produce of another plant, viz. the *Alpinia Galanga* (Willd). Yet, oonsidering the wide distribution of *Zingiber officinale*, it is quite possible that the true ginger may also be cultivated in some parts of China.

The quality and commercial value of the dried rhizome from different localities varies considerably, being influenced very much by the method of cultivation, collection, and preparation.

Ginger is largely produced in all the warm and moist parts of India, up to an elevation of 4000 to 5000 feet. The best pieces of the previous year's harvest are selected and sheltered in a corner of an outhouse; the heap is then covered over with cow-dung to keep the roots from drying up. The land is prepared by ploughing it up two or three times, and then dividing off into beds, with a little raised edge round each bed, care being taken to make openings to allow superfluous water to run off; for if water stands on the crop the roots will rot. Pieces of the roots one or two inches long are then buried three or four inches deep in the soil at intervals of nine inches, and the field is next covered over with the leaves of trees, which keep the soil moist; over the leaves is spread to a depth of half an inch; when rains, the water, impregnated with manure, filters readily through the leaves to the roots. Artificial irrigation is not employed during the rainy season, but after that period it is necessary. During the first three months of the dry season the field is weeded three times. At the end of that time the plants will be about two feet high, having eight fibrous tubers to each shoot; these are dug out and buried in another place for a month. They are then taken up, and if intended for use as "green ginger," are simply exposed to the sun for one day. If intended for dry ginger, the fresh roots are put into a basket, which is suspended by a rope, and two men, one on each side, pull it to and fro between them by a rope attached, and thus shake the roots in the basket; this process is carried on for two hours each day for three or four days. After this the r are dried in the sun for eight days, and again shaken in the basket. A two days' further drying complet s the process.

In Jamaica (where the finest ginger is produced) it has been ascertained that the soil whioh yields the very highest quality known in the market is the deep, black soil of the virgin fôrest; but to grow ginger under this condition involves the destruction o larg areas of forest. Magnificent trees six feet in diameter may be seen in some districts lying rotting on the ground, while the ginger cultivators have gone further to the centre of the island. The plan adopted for clearing a forest is for a cultivator to invite a few of his friends to a "cutting.match"; he provides food, etc., and the laborious work of felling trees is carried on merrily, and without much expense. Afterwards fire is applied, and the place is burnt over. This burning is considered very important; probably because the resulting deposit of the mineral matters or ash returns to the soil those inorganic constituents which had been abstracted therefrom by the trees. Besides undoubtedly, the fire also sweetens the ground, corrects sourness, and, moreover, it destroys insect pests. Some cultivators will grow ginger only in freshly-cleared woodlands, and the next year they move on to a new clearing; but although they get in this way very fine ginger, it is at the expense of forest land. Albert Town was not so long ago a centre

for the cultivation, but it seems that growers have already got as far as fourteen miles further inland. Although ginger is an exhausting crop, and growers have been advised not to plant it on the same ground two consecutive years, it can be and is grown in many places year after on the same ground, but in this case it runs wild—or, as it is called "ratoons." The "plant ginger" (the produce of planting) is of better quality than the ratoons, which, become inferior in each succeeding year. When the ground is too poor to grow white ginger, then the inferior blue variety can be grown.

As regards the application of manure, there is a prejudice against it in the West Indies, some growers maintaining that it breeds worms, and that there is a difficulty in getting it in any quantity. It is probable that those who have not succeeded with manure have used it improperly by applying it fresh or not sufficiently mixed with soil. As to obtaining it in quantity, example should be taken from the Chinese labourer, who preserves every particle of matter that can in any way be utilized as manure—not only cattle manure, but decaying matter of any kind, night-soil, etc.; even soapy water left after washing is very useful. To imitate the formation of forest soil, a pit might be filled with alternate layers of bush and manure; everything in the nature of manure or decaying matter should be thrown in, and a layer of soil directly over the manure would be useful. The pit ought to be lined with clay, to prevent the very valuable part of the liquid of the manure from escaping, and a cover of some kind should be placed over the pit to keep out rain. Such a compost, when quite decayed, would be found very useful for refertilizing the soil.

In some part of Jamaica a soil of well-drained clayey loam is selected. The method of planting out is the same as in India (above described). The small pieces of root are set in March or April. The flowers appear in September. When the stalks wither in the following January or February, it is time to dig up the roots. At this period these are fibrous and fit for drying; but if required for preserving in syrup, or candying, they should be dug up before the period, whilst they are still succulent. The mature rhizomes for drying are separately picked, washed, and scraped; they are then dried in the sun and the open air. Occasionally, owing to a very wet season, the people cannot dry the ginger in the sun; it then mildews, and the badly cured ginger sometimes found in the market is more frequently the result of this cause than of want of care in curing it.

Dried ginger is called by the dealers "races" or "hands." It is in flattish, jointed, branched or lobed, palmate pieces, which rarely exceed four inches in length. The Barbadoes, Bengal, and African gingers are covered by a dry, shrivelled epidermis commonly called the "coat"; hence these sorts are usually said to be "coated" or "unscraped," whereas the Jamaica ginger and some of the sorts brought from Malabar and Bengal have been deprived of their epidermis, and are, therefore, called "uncoated" or "scraped." The external colour varies in different sorts of pale or bright yellow to dark or brown; the palest sort is the fine Jamaica, and this realizes the highest price. Cochin ginger resembles it, but is of a pale brownish tint externally. According to some authorities, the chalky-white appearance of the so-called "bleached ginger" is produced by submitting the root to the action of the fumes of burning sulphur or by washing it in a solution of chloride of lime; but it is also likely that this appearance results sometimes from a simple application of chalk or plaster of Paris.

The interior of the dried root varies like the exterior in colour; the best is that which cuts pale but bright. The consistence of ginger, as ascertained by cutting, varies from soft to hard, or, as it is termed in trade, "flinty," the soft being preferred.

The Chinese ginger (above referred to as *alpinia galanga)* is cultivated in nearly all parts of the province of Kwang-tung. The districts of Nan-hai, which belongs to the city of Canton, produces greater quantities and a better quality than other neighbouring districts. The independent tribe of the Misotsu, in the mountains at the north-western border of the same province are also said to produce large quantities of ginger. In the district of Hsin-hsing, about thirty miles south of the city of Chao-ching, on the Western River, three-tenths of the flat land and seven-tenths of the cultivated soil in the hills are planted with ginger. A distinction is made between the flat land ginger (called in the Canton dialect *Ten-Keung)*, which is generally soft and tender, and mountain ginger *(Shan-Keung)*, which is brittle and very pungent. This is generally used for home consumption; the Chinese pickle it in vinegar. The expensive *Ten-Keung*—syrup ginger—is almost exclusively consumed by foreigners or exported.

The marked difference between the Chinese preserved ginger and that from the West Indies has been carefully investigated at Kew, with the result that they are now considered to be produced from the West Indies has been carefully investigated at Kew, with the result that they are now considered to be produce from distinct plants, as above explained.

The plant furnishing "Siamese ginger" is reared in a desultory manner in almost very village, but so little care is bestowed upon the culture and drying that it markets at a very low price in the local bazaars. The best quality is procurable from the bazaars frequented by hill tribes.

The yield of essential oil from various dry gingers ranges from 1·9 to 2·7 per cent. The oil is yellow in colour. Its odour is intensely that of the root—the oil of Jamaica root being the most fragrant—but no variety yields an oil possessing the punget burning *taste* of ginger; this taste is due to *gingerol*, the active principle of the root, and exists to the extent of from 0·6 to 1·45 per cent. It can be eliminated in the form of a viscid fluid of a pale straw colour, entirely devoid of odour, and of an extremely pungent and slightly bitter taste. It is very soluble in alcohol, even when highly diluted.

The total imports of ginger into the United Kingdom during 1894 were as follow:—

	cwt.
From India, the Straits, and Ceylon ..	57,922
,, British West Indies	6,848
,, Hongkong and other British Possession ..	1,360
,, Sierra Leone	14.933
,, Various foreign countries	4,401
	85,464

Powdered Ginger is sometimes adulterated with rice flour, but this is readily detected by the microscope. A more serious adulterant has lately come into use namely the addition of from 10 to 30 per cent of exhausted ginger, which is practically valueless. This can only be detected by a careful chemical examination.—*Planter's Gazette.*

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(To be continued.)

COFFEE PLANTING IN BRITISH CENTRAL AFRICA.

A despatch has been received at the Foreign Office from Sir H. H. Johnston, Her Majesty's Commissioner and Consul-General in British Central Africa' with regard to coffee planting in these parts.

Sir H. H. Johnston states that coffee flourishes in almost any part of the British Central Africa Protectorate. At one time it was thought that its cultivation must be confined to the highlands above 2,000 ft in altitude, but it has since been found that coffee grows equally well in quite low-lying parts. The Liberian coffee, of course, actually grows better in the tropical plains, but as this kind does not fetch such high prices as the Mocha variety, which is the kind chiefly planted in British Central Africa, it rather the facilities for growing the last-named variety which must be taken first into consideration. It is not that the Mocha coffee will grow quite as well in the plains not many feet above the level of the sea as it will in the hills, but it may be stated posi-tively that it grows as well at an altitude of 900 ft. above the sea as at 3,000 ft. Above 3,500 ft. the coffee is liable to be nipped by frost in the cool season.

Throughout British Central Africa the soil is nearly every-where very fertile—too fertile in some places—as it is absolutely virgin soil, and this excessive richness is doubtless the cause of much of the malarial fever which prevails. Not only is the soil rich, but it is everywhere well watered by perennial streams which render irrigation during the dry season practicable.

The average rainfall in British Central Africa is 50 ins. per annum, but in most of the districts it is about 45. The least rainfall in many district is probably 36 ins. The highest rainfall is in parts of the Mlauje district, where it attains in some years over 100 inches. The rain falls principally in the months of December, January, February, March, and April. There are heavy rains at the latter end of November. and occasional showers in May and June. It often occurs also that rain falls in the hills during August. In the hill-country—and most of British Central Africa may be described as such—it may be said that

no month passes without a shower of rain. Nevertheless, it should be broadly stated that five months of the year are very wet and seven months of the year are very dry. This want of a more general distribution of the rainfall is not such a favourable feature as would be the more regularly distributed rain which occurs in Ceylon.

The climate in most parts of the Protectorate is agreeable, but it cannot be described as healthy. Neither can it be described as very unhealthy. The chief condition of health is comfort. Europeans who make themselves thoroughly comfortable and do not expose themselves too much to the sun, and who lead a thoroughly temperate life, seldom have occasion to complain of their health. Almost the only disease which causes any anxiety is malarial fever. There is very little dysentry, and it is of a mild type. Dysentry is hardly ever met with except in the plains. The climate is on the whole beneficial to persons of a consumptive or asthmatic tendency—very beneficial in fact to the latter, who often maintain better health in British Central Africa than in other parts of the world.

The whole of the Protectorate is now absolutely safe for European settlers, the entirety of it being under the direct control of the Administration. The natives are very well disposed towards the Europeans. There is a native population of about 1,200,000, but this is rapidly increasing by immigration from the countries outside the Protectorate into the more settled districts. Labour is very cheap and fairly abundant. It is the great cheapness of labour, however, which the principal attraction that British Central Africa can offer to coffee planters, and which atones for its inferiority of climate and rainfall as compared to Ceylon. Adult labourers receive wages to the extent of about 3s. a month. At some periods of the year food is given in addition, making the cost of adult labour about 4s. 6d. a month. The labour of women and children is paid for at lesser rates.

The price of land ranges at present from 5s. down to 2s. 6d. an acre, but, owing to the considerable demand for estates, it is possible this up-set price may increase. Land in Blantyre or in the vicinity of that township fetches rather high prices—from 100l. to 120l. an acre. Except within the settled and civilised shire districts, the price of land is hardly likely to exceed 2s 6d. an acre for some time to come. As regards the sale of Government land, however, no estates exceeding 4,000 acres in one spot are permitted to be sold, and, as a rule, 1,000 to 2,000 acres is the area chosen. About one-eighth of the land in the Protectorate belongs to the British South Africa Company, the African Lakes Corporation, and some 200 European settlers. About three-eighths of the land is permanently secured to the natives, and about half of the total land area of the Protectorate is now at the disposal of the Government, though, with a view to native expansion, it is intended to alienate more than about a quarter of the total land area.

Although the bulk of the settlers are of British nationality, there are other nationalities represented, viz, Dutch, Austrians, Germans, French, and Italians. The nationalities are given in the order of their majority as regards number of representatives.

A constantly extending transport service is now carried on throughout the Protectorate by the African Lake Corporation, Messrs. Sharrer, Zambesi Traffic Company, the African International Flotilla Company, and the Oceana Company. At present the cost of transporting goods from British Central Africa to London may be roughly estimated at an average of 15l. a ton—ranging from 20l. a ton from the north end of Lake Nyasa to 4l. a ton from the Lower Shiré. From the Shiré province, which is the most settled district, the average cost of transport is perhaps 10l. or 11l. a ton (7l. from Blantyre). The cost of transport from England to British Central Africa is about 1l. a ton more than the figures given, the difference arising from the greater facilities for sending goods down stream compared to the hauling of them up stream.—*Board of Trade Journal*, May 1896.

PURE COFFEE.

The paper that was lately read at the Chamber of Commerce on the subject of agriculture took a view of how oppressed this department is by rates and taxes. The medical profession decided that if milk could be obtained in a pure form it was extremely valuable as a food, and, further that its consumption would be very largely increased. All this has taken place, and even now the analytical chemist is continually on the watch to attack either the farmer for sending milk of too poor a quality to market, or else the retailer because his milk is not up to the standard.

Lately, at the Annual Meeting of the Chemical Trade Section of the Chamber of Commerce, I put it to some of the analytical chemists who belong to our branch whether they were not now pretty well satisfied with the quality of the milk; they admitted they were. I then asked them another question, viz., were they not aware that, at the present time, if they went into almost any hotel, restaurant, coffee-house, and many private houses, they could not obtain pure coffee, and that at many railway stations the beverage called "coffee" was nothing but an adulterated mixture? They admitted this to be the case, but said they had not been instructed by the Government to proceed against this vile system of the adulteration of coffee.

I took the opportunity of explaining to the Committee that the adulteration consisted of beans, bad dried fruit ground up, and as a fact the very best and richest coffees yielding the best flavours were all sold at a high price to people who used them, because they would flavour the largest amount of adulterating matter.

After the deputation waited upon the Chancellor of the Exchequer, at the end of February, to appeal against the duty on coffee, I wrote to the Chancellor of the Exchequer telling him that I entirely agreed with some of the members of the deputation, that the reason of the falling off in revenue from coffee was attributable to the filthy adulterating matter that was employed when people required and purchased ground coffee.

I am glad to say that the Chancellor of the Exchequer took the same view that I did upon the matter, and agreed with some of the members of the deputation that waited upon him; and it was pointed out that the department responsible for allowing this adulteration, and, in fact, robbery of the Exercise, is conducted by Sir Michael Hicks Beach. If these facts are admitted, we may conclude that the poor English farmer, who has delivered to the hotel or restaurant pure milk, has been most unfairly treated by the Government authorities, for he has been forced to abide by most stringent conditions; and now he finds that the vendor of "coffee," so called, may sell and admixture in a shop, and other vendors may sell any adulterated article under the name of "coffee" direct to the public.

The coffee dealers in Mincing-lane, who have an immense stake in this business, subscribed together and formed a committee, and they gave pure coffee to certain people as long as they would agree to sell it to anyone who asked for a cup of coffee at their establishment, and there are very few establishments left now where the sale of this pure coffee has been continued.

Would it not be fairer to trade in general if the Government administrated justice in this branch? because I maintain that, now we have such excellent quality of milk, good coffee would be greatly appreciated, and very soon coffee drinkers would be able to discriminate between the different sorts of coffees that were supplied to them.

While discussing this question from an English point of view, I should like to further remark that in France, now, it is most difficult to get a cup of pure coffee; so much so is this the case, that if you ask at a good restaurant for a cup of their best coffee after breakfast or after dinner, they charge you an extra price for it.

In Germany the so-called "coffee" which is supplied contains really less of the pure berry than it does in either England or France, and immense quantities of figs and dates are sold to adulterate the

coffee—iu fact, I am informed that the adulteratiug material is present in a larger proportion than the pure coffee. Yet in both France and Germany it is most important that the trade of their colonics should be fostered! In conclusion I would like to remark that so many people ask for coffee, and if they only had purc coffee given to them, the demand for genuine coffee would be so great that it would causc a rise in the market price, and at oncc tend to improve the revenues of our dependencies.

THOS. CHRISTY.

—*Journal of the Society of Arts.*

THE APPLE-TAINTED TEA QUESTION

LONDON, July 3rd.

The Tea and Produce Committee mention Monday afternoon to discuss the apple-tainted tea matter. There were present Messrs. Rutherford, Chairman, W. Martin Leake, Dickson, Cameron, Stanton, C. Scott, G. White, A. L. Hutchison. Brooke, Thompson, J. Hamilton, (who is now no longer with Messrs. S. R ucker & Co., but has an office in the same building), Corbert, who was made a partner in Messrs. iWhittall & Co., just before Mr. Whittall's death and who has no Ceylon experience whatever), and Keith (of Messrs. Arbuthnot, Latham & Co., the largest importers of Ceylon tea on this side). It appears the position Messrs. Anderson, Auderson & Co., have taken up is one that does not leave much hope that they will accede to the demands of the twenty-one firms claiming about one thousand pounds (£1,000 sterling), although I am told that the market loss is a good deal more than that sum. There is precedent to back the demands of the claimants, for the Orient Line allowed a certain amount upon a small shipment of tea which was affected by oranges taken in at Malta. There seems to be a good deal of difference, however, between the taint produced by oranges versus apples, It *was* said that the oranges flavoured tea found considerable favor amongst buyers, and actually fetched 1d. or 2d. per lb. more than it was expected to realise under ordinary circumstances. That term "orange pekoe" is still a delusion and a snare to many a tea retailer and consumer. It was only this week I was asked for a tea "flavoured with orange blossoms." Possibly it was for a wedding! To see what the ordinary tea man would say if asked for such an article I went into one of the large city retailers and asked for it. It was promptly produced a China pekoe "made with orange flowers, and whence the term orange pekoe was derived;" the man said. The price was 3s. per lb. But, however favourable may be the sales of orange flavoured pekoe and other grades, there is not much doubt that the smell of a ripe strong apple is not a desirable addition to your staple. If it is necessary, as it is I hear, to charter special steamers from Jamaica to carry bananas, it seems advisable that those eugaged in the apple-carrying trade from Australia should go and do likewise. Rum and sugar as an instance, has always to be kept entirely separate from coffec, except when a certain well-known Ceylon merchant sent them all off together during the "diggins" time to Australia and scored the best deal there he ever did in his life. The season for the Australian apples covers a period of about two and a half months, and unless some special arrangements are made by the Orient and P. & O. people they will fiud themselves pariicularly short of freights from Colombo in the future during that time. I have heard it stated here, and on good authority, that auy tea that comes home in an apple ship is uuder a disadvantage whether it is tainted or no. Certain people make it their business to ferret this information out and take advantage of it to lower the price by reports that the tea is tainted. We all know these methods on the Stock Exchange. Why should the tea market be free from such modern highwaymen? Short of freights these liners will be, and their troubles will not cease at the apple season point. Several chiefs here have wired out instructions to Colombo not to ship tea at all by either line without a guarantee That guarantee has, I am informed, been refused, and the business is passiug into other hands. And certainly unless these lines put the whole matter on a more satisfactory footing than it at present is, these firms will adhere to their decision and doubtless others will follow. The Indian bill of landing for tea is worded differently to those in use from Colombo. A clause is stamped on that hides, turmeric, and several other evil-smelling articles will not be carried on the same deck as tea. But not one of those articles eumerated on the Indian tea bill of landing is in tho same street with apples, especially if they are a little more ripe than they are usually carried. The Tea and Produce Committee decided that the Chairman and Messrs. Cameron, Dickson, and Keith be formed into a sub-committee to reply to Messrs. Anderson Anderson & Co.'s letter, and to draw up a tea clause to be stamped on all tea bills of landing similar to that in use on tea from Calcutta. That clause they will endeavour to get the Shipping Companies here to agree to, and if they succeed the tea per "Cuzco" and "Austral" will not have been spoilt in vain, although even such a clause will not dispose of the reports which are put about, and it is also the opinion of many here that the bad results from apple taint are not to be got rid of by carriage on a seperate deck.

SMALL BREAKS.

For the past eight years the question of small breaks has been forced upon the attention of brokers and others here, and the Tea and Produce Committee has from time to time discussed the matter. The big men, who will not even look at anything below a certain size of break, leaving the smaller fish to the smaller fry, have object d to being kept idly chewing their quills, whilst smallest lots are being sold. The Brokers' Associatiou has approached the Tea and Produce Committee to increase the Ceylon limits to 18 chests, 24 half-chests and 40 boxes. This will doubtless be carried through, and anything under these limits will be relegated to the small lot sale. Of course, the object really is to induce the planter to increase the size of his breaks, the enormous quantity of different teas to be gone through being a great tax. Even ono half-chest of dust sent separately must be liquored and valued, and there are a great number of little "dabs" in the Ceylon sales that are perhaps unavoidable, but none the less difficult to deal with. Various days and times have been suggested for the small lot sale. Wednesday has been spoken of as a good day. It has been said that Thursday might be devoted to it, or that the "minor canons" might be disposed of at 2 o'clock on Tuesday, at the same time the "big guns" are buying in the big sale. If the result of the above increase of limit is that the small lot sale becomes more important, perhaps the division of the sale of tea that the abortive Thursday's sale was to effect will be better carried out by the sale of the "gros" lots, and the little "dabs" in separate rooms. The Ceylon Planter whose shipments are small is better off than the Indian Planter, the limit for the teas of the latter being 20 chests, 30 half-chests, and 50 boxes. As Ceylon properties become more and more absorbed into limited Companies, however, the small lots will berhaps show a tendency to become fewer and fewer. But there is no doubt there are plenty of buyers here who took as carefully after the small breaks as the big men do after the large, and it would be instructive if some one who knows all the buyers would inform the Tea and Produce Committee how many of the usual bidders are unrepresented at the small break sale. Very few, I fancy, although possibly the bidding is done by a less important representative of the firm than at the big sale.—Local "*Times.*"

FLORIDA CAMPHOR.—The Florida camphor-forest is looking up. We mentioned sometime ago that many camphor trees had been planted there. Now it is reported that a small quantity of an excellent quality of camphor has already been made, and a sample lot has been sent to Washington for analysis. Experiments will be undertaken to ascertain which roduces the more camphor, the trunk or leaves of the tree.—*Chemist and Druggist*, June 27.

HE MIGRATIONS OF THE TOBACCO PLANT, THE FARNESIAN CASSIA, AND THE LOMBARDY POPLAR.

I would solicit a brief space to record in the *Journal of the Society of Arts* some criticisms I have received from a scientist of the highest authority, in correction of statements made by me in the course of my remarks on Mr. Tripp's recent paper on "The Tobacco Industry of India and the Far East."

1. My correspondent writes:—"It is by no means certain that the Old World owes the Farnesian Acacia to the New. It appears to be indigenous to Australia, and not impossibly to Asia."

I was aware that the *Acacia Farnesiana* had been identified by Fraas with the "white Acacia" of Theophrastus, and the "Acacia in Cappadocia," &c., of Dioscorides; but I know of no solid ground for this identification; while, on the other hand, it is described as a native Chilian plant by Molina, in the 16th century, from which date it is gradually trace through a succession of writers eastward, in Italy, the Morea and Greek Islands, in the gardens of Egypt and Arbia, and in Western India. From Buenos Ayres, it was carried by Europeans into Louisiana, and as far north as Charleston, and again by Europeans it was carried from America westward to Tahiti and the Philippines, to Timor and Java, and appearently to Burmah and the Coromandel coast of India. It has now overspread all India. Everywhere its name seems to be derived from its exquisite "aroma," and as the Greek writers do not refer to this, its overwhelming characteristic, I accepted it as a plant of exclusively American origin, and one of the most delightful gifts of the old world to the new. It is first botanically described by Hyacinthus Ambrosinus A.D. 1605 72.

2. My correspondent writes:—The 'Lombardy Poplar' is only a fastigiate variety of our *Populus nigra*, and is certainly not American." And again: —"The 'Lombardy Poplar' is European, but the 'Black Italian' is American."

I am not entitled to gainsay this dictum, but I reasoned thus. The Greeks and Romans knew only the three following poplars —

Populus alba, Linn.: the cherois [ie., "of Acheron"] of Iliad xiii. 389 and xvi. 482, the "lenke" of Theophratus and others, and the "populus alba" of Pliny xvi. 35 (23);

P. nigra, Linn.: the "aigeiros" of Iliad iv. 482, Odyssey ix. 141 and x. 510, and of Theophrastus, and Hippocrates, and the "populus nigra" of Pliny, *loco cit.*

P. tremula, Linn: the "aigeiros makednos" of Odyssey vii. 106, and "populus Lybica" of Pliny in *loco cit.*

These three *P.* (*canescens* being regarded as a variety of *P. alba*, and *P. græca* of *P. tremula*) would seem to be the only poplars truly indigenous to Europe; the rest being nearly all American species. But to-day there is to be seen everywhere throughout Europe the pyramidal "Lombardy Poplar," *populus fastigiata*, said to be a variety, but if so a powerfully differentiated variety of *P. nigra.* Some regard it as a native of Central Asia others of North America, *i.e.*, of Carolina' and the valley of the Mississippi. It is the *P. italica-carolonensis* of Brugsdorf; and inasmuch as it was not introduced into Lombardy, between Milan and Pavia, before the 17th century, nor into France and Great Britain before the 18th century I concluded that it came into Europe rather from the Mississippi than from Persia. Had this "Kensp kle" poplar been a native of Anterior Asia it seems to me that Homer would certainly have known of it, and given it a discriminating epithet, "puramidikos" or the like.

3. My correspondent writes:—"There are only two tobaccos used, the pink flowered *Nicotiana Tabacum*, and the yellow *N. rustica.* I doubt if the latter is much grown, except in the Levant, for cigarettes. I do not believe it furnishes Brazilian, Germany and Hungarian tobacco. You perpetuate a very old error about Persian or Shirzaz tobacco.

N. persica is not a variety, but a species. It is the same as *N. alata*' and white flowered. It does not yield tobacco. The blunder is due to Lindley; and Shirzaz tobacco is only the ordinary *N. tabacum.*"

I relied on Lindley and Pereira, but on referring to the "Kew Bulletin," No. 52, for April, 1891, for for having overlooked which until to-day I am most blameworthy, I find that Mr. Thiselton Dyer has there conclusively demonstrated my critic's contention on this point. I erred through writing "in a castle (of Indolence)—cock-sure."

GEORGE BIRDWOOD.

—*Journal of the Society of Arts.*

THE PROSPECTS OF THE CINCHONA AND QUININE MARKETS.

It is not a little remarkable that one of the most valuable and best-known drugs, namely, quinine and one of the most valuable and best-known flavouring agents, namely, vanilla, should quite recently have been occupying a considerable amount of commercial attention; the first in consequence of the opening of a new quinine factory in London, and the second in consequence of the extraordinary advance in the price of vanilla, which has been going on for some time. In reference to the first, *the Chemist and Druggist* makes some remarks on the commerical prospects of the company, and on the cinchona-bark produce generally. In the first place, it expresses an opinion that the establishment of a new factory is not likely to have any serious effect upon the market position of the drug, though the entire output of the factory for November was said to have been sold before the month was half through. "The chief point of interest in the situation," it is said, "is that the new factory is the only one in Europe not bound by the 'agreement,' 'convention,' or 'understanding' which has existed for more than a year among the older makers, and has given a healthy tone to the quinine markets." It is further pointed out that the product of the new company is an unknown brand, and that it will take some time to convince the average consumer, especially a British one, who is proverbially loth to leave his time-honoured sources of supply, that the article has all the excellence of the old brands. The possibility of the new makers underselling their rivals is also discussed, and should the older makers declare war upon the new comers, it is considered possible that we may return again to the price-cutting days of 1892, when quinine was purchaseable below 10d. per oz. "The new factory starts at a time when the older manufacturers were believed be to contemplating an all-round advance in their quotations early in the coming year. From the quinine-maker's point of view, the market has been mending for some time, notwithstanding the fact that there has been no improvement worth speaking of in the second-hand quotations, and that the maker's prices have remained unaltered for months. The second-hand stock of quinine in London has been reduced to manageable proportions; the cinchona-bark supply in this country is too small to place any serious impediment in the way of a rise, and at least one of the large German quinine work has been deliberately kept closed all through the summer months. Only the Java producers remain hopelessly disunited. Their exports of cinchona-bark in October reached the enormous total of over 1,200,000 lb. (1,100,000 Amsterdam lb.), and in their present disorganised condition they are almost at the mercy of the quinine makers so far as the price of their produce is concerned. At the present time, the quinine manufacturers pay for the quinine in the bark only about one-fourth of the price at which they quote their finished product, and if only the second-hand stock of quinine were smaller than it is they would not be at all badly off. The facts here stated show to what lengths and variations the traffic in cinchona bark has extended in the space of time within the memory of many, when the bark was drawn from its native South American forests, and when the manufactured article, quinine, was sold at a guinea an ounce.—*Journal of the Society of Arts.*

E DIMBULA VALLEY (CEYLON) TEA COMPANY, LD.

STATUTORY MEETING.

The Statutory Meeting of this Company drew quite a number of shareholders together at the Company's Office (Messrs. Rowe & White), 16 Philpot Lane, E.C. Mr. James Sinclair occupied the chair and was supported by his co-Director's Messrs. Rowe, Forbes Laurie, Macdonald, and T. C. Owen and the Solicitor to the Company, Mr. Templeton (of Messrs. Templeton and Cox). Among shareholders present were:—Messrs. Donald Andrew, Leslie, Sanderson, E. T. Delmege, F. D. Mitchell, J. R. Grant, Russell D. Reid, G. E. Worthington, &c. The notice of the meeting having been read, the Chairman explained the position of the Company, and though it was understood this meeting was not one for press reports; yet no harm can occur from letting Ceylon readers understand what passed. It was mentioned that a telegram had come to hand just before the meeting, from Colombo, announcing that all was clear now for the transfer of the estates and that so soon as this was effected, a further and general meeting of shareholders should be called together. Meantime, Mr. Sinclair referred to the highclass and valuable properties owned by the Company and noticing certain press criticitsm he would say it was not correct that he was taking a large amount of cash out of the estates—in fact his own interests and those of his family were bound up with the Company on which they would be dependent for their salt, and if this Company did not pay, and long continue to pay good dividends to its shareholders, then all he could say was "God help Ceylon tea plantation owners." (Hear, hear.)

It was then intimated that any questions might be asked and a SHAREHOLDER said that he had come to the meeting prepared to make certain remarks; but after what he had heard, he would not make them.

Mr. F. D. MITCHELL wished to get information on a number of points—(1) as to the application to the Stock Exchange for a quotation and whether the Agreement with the Vendor as well as the Articles of Association had been formally submitted to the Committee. The SOLICITOR gave assurance this had been done and certain alterations were suggested, which had received attention and they expected approval from the Stock Exchange-Committee shortly.—The Mousa Ella mortgage was then discussed and the arrangement entered into about it which was done under legal advice. It transposed also that while the prices of Elgin (£20,000) and Belgravia (£15,500) equalled £35,500; those of Bearwell and Mousa Ella amounted to £55,000.—The Lawsuit about a right to watercourse on Mousa Ella would be prosecuted on behalf of the Company. MR. WORTHINGTON following Mr. Mitchell referred to the Mousa Ella transfer as to whether it secured a clear title from the Vendor and it came out that the Colombo Solicitors had given their opinion that the title was a good one. Some discussion followed as to whether the Vendor, rather than the Company, should not bear the risk of any future action and after some discussion with the Solicitor, MR. J. FERGUSON said that all in the room who knew the Messrs. de Saram of Colombo would place great confidence in their opinion; while he wished to know whether, as a matter of fact, there had been any notice or suggestion of an action.—None whatever was the response. The Solicitors would be happy to give any further information to shareholders at their offices and the whole could be discussed at next meeting.

A SHAREHOLDER wished to have some information about crops.

The CHAIRMAN stated that the first sale of Lippakelle realized 1s 1¼d and the next 11¾d; while part of an Elgin shipment averaged 8½d, but part was withdrawn, owing to Ceylon teas having been unfavourably affected—the market at last sales disorganised—through a large shipment of Ceylon teas in coming over getting tainted to some extent by contiguity with a cargo of apples. Such was the report. He felt no doubt that stand-out prices would be secured for all the teas from the Company's estates.

The meeting closed, with the understanding that the next would be called together as early as possible.

SPRING VALLEY COFFEE COMPANY, LIMITED.

REPORT.—To be presented to the Thirty-first Ordinary General Meeting of the Company to be held at No. 5, Dowgate Hill, London, on Wednesday, the 27th day of May, 1896, at 1 o'clock p.m.

The following Annual Accounts are now presented to Shareholders, viz:—Profit and Loss Account for Crop 1894-5. Balance Sheet made up to 31st March, 1896.

CROP 1894-5.—In last year's Report Shareholders were informed that the coffee crop of the above season was estimated at 1,400 cwt., and it will be seen that the actual weight sold amounted to 1,658 cwt. 0 qr. 3 lb. exclusive of clean and refuse coffee sold in Ceylon. This crop realised £7,890 9s 9d, the average selling price in London being 91s 10d, as compared with 98s 5d per cwt. obtained for crop 1893-4.

The yield of tea amounted to 219,180 lb., the estimate in last Report being 215,000lb., and this, together with 55,160 lb., bought from neighbouring estates and manufactured at Spring Valley, sold for £10,685 8s. 1d., or an average of 9·34d. per lb., the average selling price last year being 9·15d. per lb.

Sales of Cinchona Bark realized £13.

The total proceeds from the sale of produce amounted to £18,618 17s. 10d., and deducting from this £12,056 12s. 5d., the total expenditure in Ceylon and London, there remains a profit of £6,562 5s. 5d. on the year's working.

To this has been added the sum of £32 11s. 9d. brought forward from last year, making a total of £6,594 17s. 2d. at the credit of profit and loss.

On the 7th November last an interim dividend of 2 per cent. was paid on the capital of the Company, and the Directors recommend that a further dividend of 3 per cent. be now declared, making 5 per cent. for the year, and leaving £2,594 17s 2d. to be carried forward to next account.

The Directors cannot recommend a larger distribution of profits, as they consider it advisable to carry forward a sufficient sum to ensure the rapid extension of our tea area.

The comparatively large crop of coffee secured last year appears to have greatly weakened the coffee trees, and, though everything is being done to retain the coffee area, it is feared that much of it will have to be planted with tea this year. In any case the crop will be a very small one.

Tea continues to do well, and during 1895-6 it is expected that a crop of 280,000 lbs. made tea will be secured. During the past year the quality of our tea has been well maintained. It will be seen that the crop realized 9·34d. against 9·15d. for the 1893-4 crop.

The acquisition of Kotagodde Estate sanctioned at the Extraordinary Meetings held last year has been duly completed, and the Directors are well pleased with the purchase.

The area under Tea is as follows:—

TEA.

Over 5 years old		741	acres.
Planted Nov./Dec.	1892	53	,,
,, ...	1893	243	,,
,, ...	1894	179	,,
,, ...	1895	145	,,
Area under Tea		1,361	,,
Area under Coffee		538	,,
Area under Fuel		57	,,
Forest Patna and Waste ..		297	,,
Total Area ..		2,253	acres.

The Directors regret to announce the retirement of Mr. H. H. Potts from the Board, owing to ill-health. Mr. P. C. Oswald has been selected to fill the vacancy. Mr. Oswald retires on this occasion, and, being eligible, offers himself for re-election.

J. Alec Roberts, *Secretary*.

18th May, 1896.

OUVAH COFFEE COMPANY, LIMITED

Report.—To be presented to the Thirty-third Ordinary General Meeting of the Company, to be held at No. 5, Dowgate Hill, London, on Wednesday, the 27th day of May 1896, at 12-30 o'clock p.m.

The following Annual Accounts are now presented to Shareholders, viz.:—Profit and Loss Accounts for Crop 1894-5, Balance-sheet made up to 31st March 1896.

Crop 1894-5.—In the Directors' last Report the Coffee Crop of the above season was estimated at about 1,000 cwt., and it will be seen that the actual weight sold in London amounted to 1,208 cwt. 2 qrs. 14 lbs.

The proceeds amounted to £5,646 14s. 10d., giving an average of 93s. 5d. per cwt., against an average of 99s. 8d. obtained for the previous crop. Coffee sold in Ceylon realized £149 8s. 1d.

The crop of Tea was estimated at 575,000 lb., and the actual weight sold from the Company's own estates was 564,000 lbs. Besides this, 349,483 lbs. of Tea manufactured from leaf bought from neighbouring estates were sold.

The value of all tea sold was £34,587 6s 11d, or an average of 9.08d per lb. as compared with 8.66d for the previous season.

Cocoa, weighing 270 cwt. 0 qrs. 3 lb. realized £657 19s 7d, the average selling price being 48s 9d per cwt, against 60s 4d for the former year's crop.

It will thus be seen that the total value of all produce sold amounted to £41,090 12s 7d.

The total Expenditure for the year in Ceylon and London amounted to £30,022 11s 9d, and deducting this from the value of the Produce, a profit is shewn on the season's working of £11,068 0s 10d. To this has to be added the sum of £83 0s 11d brought forward from last year, giving a total of £11,151 1s 9d at the credit of Profit and Loss Account.

An Interim dividend of 3 per cent on the capital of the Company was paid on the 7th November last, which absorbed £3,000 of the above-named sum, and the Directors now recommend that £5,000 be applied to the payment of a further dividend of 5 per cent, making 8 per cent for the year, and that the balance of £3,151 1s 9d be dealt with as follows:—

To write off the balance of the cost of Ledgerwatte	£1,000	0	0
To be credited towards Cost of Badulla Tea Factory	1,000	0	0
To be carried forward to next Account	1,151	1	9
	£3,151	1	9

The result shewn above cannot but be satisfactory

Owing to unfavourable weather during the part of the season the Tea Crop did not quit up to estimate. The satisfactory yield of made tea per acre was, however, obtained, a price shews an improvement compared with the previous year.

The whole area under tea is reported to first-rate order, and it is hoped that by the the present year we shall have 2,000 acres that cultivation. Every care is being taken t the most suitable land at our disposal for pl and to put in only the very best seed.

The four factories belonging to the Compa in full operation, and heavy outlay on this may be considered to be at an end. As furth of our tea come into bearing, increased wi space and additions to our machinery required, but no large expenditure will be ne in any one year.

It is exceedingly difficult to estimate what Coffee will be secured this year. Black b other pests have been very virulent, and th will in any case be small.

The estimated Tea Crop is 606,000 lb., and is gathered and present prices are maintai result of the 1895-96 working should be satis

The area now under Tea is as follows:—

TEA.

Over 5 years old		1,2
Planted November/December ..	1891	1
,, ..	1892	
,, ..	1893	1
,, ..	1894	1
,, ..	1895	1
Area under Tea ..		1,8
Area under Coffee ..		6
Area under Fuel ..		3
Forest Patna and Waste		4
Total Area ..		3,2

The Directors regret to announce the retir Mr. H. H. Potts, from the Board owing to il Mr. P. C. Oswald has been selected to fill the

Mr. N. Stewart, a Member of the Board, on this occasion, and, being eligble, offers hi re-election,

Messrs. Deloitte, Dever, Griffiths, & C Auditors, also offer themselves for re-electio

18th May, 1896. By order, J. Alec Ro
Secre

COFFEE NOTES.

It is estimated that the coffee crop of Liberi 50,000 piculs this year, against 30,000 piculs l

The state legislature of Espirito Santo is d the plan adopted in the agreement signed polis by the representatives of four coffee s increasing the consumption of coffee.

Francisco Schmidt, a planter residing near Preto, has sent two coffee trees to German purpose of figuring at an exhibition in that Each tree together with the earth at its root frame in which it is packed is said to wei

According to a recent official statement t in 1894 in the Mexican state of Oaxaca alone coffee trees. In 1889 the exports of co Mexico amounted to 9,213,091 kilogrammes, 1893 had increased to 14,514,919 kilogramm plantations are being constantly created.

Messrs. W. H. Crossman & Co., of Ne estimate that the Brazil coffee crop of 18 be about 10,000,000 bags, of which about bags will be marketed. Brazil has lately 55 per cent. of the coffee production of the w other countries for some years past have an average of 4,889,041 bags per annum. If duce this average the total supply for 18 be 13,389,000 bags. The consumption is cal 11,250,000, bags, from which it appears that

CONSOLIDATED ESTATES CO. LTD., (OF CEYLON).

An extraordinary general meeting of this Company was held at the London Offices of the General Managers, Messrs. Arbuthnot, Latham & Co. on 27th May, to consider and approve of an agreement issued to shareholders by the above firm from which the following are extracts:—

An agreement dated the 14th day of May, 1896, which has been entered into with ourselves as General Managers, for the purchase from us of the Knutsford Estate of 205 acres in the Kalutara district, the Rutland Estate of 582 acres in the Hewaheta district, and the Wariagalla Estate of 1,261 acres in the Nilambe district of Ceylon. These three estates are in our opinion conveniently situated for the business of the Company, and in anticipation of the Company consenting to the purchase, we have actually purchased and paid for the Knutsford Estate, and we have had the same transferred into the name of the Company, and we have entered into arrangements to purchase the other two on the 1st July next.

Full particulars regarding the prices we are paying for the three estates are given in the agreement, the amounts being approximately as follows:—

Knutsford	.. £ 5,000	Total ..	£35,000
Rutland	.. £15,600		
Wariagalla	.. £14,400		

We accordingly propose to resell to the Company for the above amount (£35,000), or such less sum as will cover our actual disbursements, with interest thereon, and we propose to charge a commission—as our remuneration for negotiating the purchase and other matter connected therewith—of 2½ per cent on £20,600, being the purchase money of the first two estates. We do not propose to make any charge of commission in respect of the Wariagalla Estate, inasmuch as we are to receive a commission of 2½ per cent from the Vendors.

With reference to the Wariagalla Estate, we beg to call our attention to the fact that a member of our firm, Mr. Herbert R. Arbuthnot, is interested in the sale to the Company, he being one of the executors and one of the Residuary Legatees of the late Mr. George Arbuthnot, his father, who owned an undivided three-fourth share of the Estate.

It is proposed that the Company should issue, for the purpose of putting itself in funds to pay for the property, £10,000 in 6 per cent. Debentures at 5 per cent premium; £13,000 in 8 per cent Preferred Shares at 10 per cent premium; and £13,000 in Ordinary Shares at par, and that these issues should be offered to the Shareholders. Should the Shareholders not take the whole, we will ourselves take or place the balance not taken by the Shareholders, but in such case the premium on the Debentures payable by us would be 3 per cent. and the premium on the Preferred Shares would be 5 per cent. The Ordinary Shares we will in such case take at par.

It is estimated that the par value of the above will cover the cost of the three estates and expenses of transfer, as well as our commission, and that there will be a small surplus, which we propose to place, together with the premium, to the credit of the "Factory and Extension Account" to provide for the opening up of the Company's Estates and for factories and machinery as may be found necessary or desirable from time to time.

The Debentures now offered will bear interest from 1st July, 1896. They rank in all respects *pari passu* with the Company's outstanding Debentures, except that their final due date is 1st July, 1931. They can be redeemed earlier by annual drawings on and after 1st January, 1898, and whenever redeemed are payable at 103.

The Shares now offered will not participate in the profit of the Company in respect of the current year partner, but no Agreement has yet been formally entered into authorising him, as a member of our firm, to act as one of the General Managers of the Company. A draft Agreement whereby this is to be done has been prepared, and will be submitted for consideration at the General Meeting, with the view of its being approved and sealed.

Mr. ARBUTHNOT, head of the firm, supported by his partners and co-Directors, presided and made an admirable Chairman. Several city men represented the shareholders with the addition of Mr. Arthur Davidson, formerly of Wariagalla, now of Dorsetshire, who his Ceylon friends will be glad to know is well and vigorous, albeit the whitening effect of years is apparent.

The CHAIRMAN explained the circumstances under which the three estates were to be added to the Company: how Messrs. E. S. Grigson and Ballardie had given careful reports and valuations above the prices to be paid; how Knutsford with its 200 acres of tea could be economically worked with one of the Company's places adjacent in the Kalutara district and was a bargain at £5,000; how Rutland (582 acres—446 in tea, grevilleas 51, patana, &c. 99, costing £15,600) was the splendid estate of Mr. C. S. Armstrong who was loath to sell and was valued at £16,100; how Wariagalla (to cost £14,400) had for long been owned by Mr. Geo. Arbuthnot and Mr. A. Davidson and was also not too dear with its 1,261 acres in all; 429 in tea, 70 coconuts, 40 cacao, and rest patana, scrub, &c.

About the prospects of the Company, the Chairman had a good account to give: the crops of tea being in every case likely to be in excess of estimates, while the temporary rise in exchange had not affected them much.

The Resolutions were duly seconded and unanimously carried and also thanks to the chair, mention being made of the good bargains made for the Company in the three estates purchased. —The Visiting Agent's reports on the three estates referred to were laid on the table by the Secretary Mr. Keith, formerly of Coimbatore.—The Chairman referred to their Colombo agents Messrs. Geo. Steuart & Co. fully approving.

PRESERVATION OF COCONUT TREES AT THE STRAITS.—The *British North Borneo Herald* of June 1st says:—Regarding the preservation of coconut trees, the Assistant Superintendents of Forests, Singapore, in his report for 1895 say:—The inspector, with the assistance of one notice-server and one climber, has been employed alternate months in Penang and Province Wellesley. One thousand four hundred and twenty five notices have been served on persons having on their premises trees, stumps, or rubbish—suitable breeding places for the beetle; and as the result, 3,608 dead trees, 3,856 stumps, and 209 heaps of rubbish have been destroyed. Seventy-nine persons were prosecuted for non-compliance with the notices served on them, and fines inflicted amounting to 170 dols. Apropos of this it may be well to state that the beetle plague appears to be practically unknown in B. Borneo. Two species, a very large weevil, and a sort of *elephas*, have been brought to the Museum as found in coconut trees. But curiously enough no work obtainable appears to mention the actual scientific name or names of the pest. Perhaps the Curator of the Singapore and Perak Museums

THE OUVAH SPRING VALLEY, AND HUNASGIRIYA COMPANIES.

The circle of Limited Companies indissolubly connected with the name of the late Mr. John Brown were among the earliest started in connection with the Coffee Enterprise of Ceylon. They were also for many years among the most prosperous, and redounded greatly to the credit of the Colony. "Glenalpine" estate—long identified with the names of Stewart, Brown and Macintyre—recognised as one of the best opened, cultivated and equipped plantations in the island, formed the nucleus of the "Ouvah Coffee Co." Spring Valley took its name from the magnificent plantation of the same name selected and first opened by Sir Wm. Reid on what was about the finest area of forest soil even in Uva, and was purchased by Mr. John Brown from Mr. Bannatyne of Glasgow on behalf of the Company. The Hunasgiriya Company connected with the well-known property North of Kandy was of more recent formation; but all three Companies suffered with the decline and fall of our staple, until their shares so long held above par, at last became almost unsaleable. How great the change now! For, although the shares of the Spring Valley and Hunasgiriya Companies have not yet fully recovered; yet they are in request and offer good prospects, while those of the parent Company are already much above par. The good done by tea is clearly indicated in this experience; for, although, coffee has continued to some extent to bridge over a time of difficulty; yet now and in the future it is on our new staple that the hopes of Directors and shareholders, are built. The late worthy and ingenious Managing Director saw as well as any one, what was coming, and he lived long enough to make sure there would be a resuscitation of his old Companies, although we could have wished, he had lived on to see the full fruition. Still more to the credit of the late Mr. John Brown, was the energy and invention he displayed in the "tea" era as in the early "coffee" days in setting to work to devise better means of preparation; and in "Brown's Desiccator" and "Roller" we have tea (as well as coconut) drying and tea rolling machines, high in favour with the planting community.

These thoughts are suggested by the annual meetings of the Companies in London, briefly reported in our last issue. It was made a proper matter of congratulation by the only Ceylon resident present that as Managing Director in succession to his father, the Companies were able to have one so well-equipped for the post as Mr. Alfred Brown, while the Board was strengthened by another esteemed business-man of Ceylon experience in Mr. P. C. Oswald. For the careful management which has always distinguished the Companies, much is due to the able clear-headed Secretary, Mr. J. A. Roberts; while what the Ouvah and Spring Valley Companies are doing in "tea" under the local direction of the Messrs. Rettie, is well shown by the fact that the average price realised for the teas in 1895 is in considerable excess of that got for 1894. All this promises well for the future; and we may hope with the present Chairman that the day is not far distant when like these of "Ouvah," the shares of the sister Companies will be quoted at, or above par. We heartily congratulate all concerned on the results already sustained. J.F.

MR. ROGIVUE'S WORK IN RUSSIA.

From Mr. A. Philip, Secretary of the "Thirty Committee," we have received the following copy of a letter received from Mr. Rogivue regarding his work in Russia:—

Moscow, May 8/20, 1896.

A. Philip, Esq., Secretary to the Thirty Committee, Kandy.

Dear Sir,—I now beg to confirm my telegram of 27th April (o.s.) and to acknowledge receipt of your reply, also to thank you for your favour of 25th April advising me of the resolution passed upon the reading of my report.

I am very much gratified by the favourable opinion expressed by the Thirty Committee, and hope, by making a wise use of the money granted, to do all that they could wish to further the interests of those they represent and trust that now I have made the start and got over the first difficulties, Ceylon tea will meet with a more rapidly increasing demand in Russia in answer to my continued efforts. With regard to details of expenditure under the £1,000 grant, all the accounts for expenses incurred up to the end of March have now come in and if it were not that Mr. Rogivue is kept so busy at Nijni Novgorod you should have all particulars by this time, but as soon as all is arranged there you shall have the detailed amounts.

Mr. Rogivue is at present occupied at Nijni looking after the arrangements for advertising Ceylon tea at the forthcoming Exhibition and Fair, where he has obtained an excellent position for the erection of a "Pavilion" not inside the Exhibition, where he found it absolutely forbidden except for Russian produce, but immediately outside the principal entrance. As the ground obtained forms the entrance to the large central garden of the biggest hotel in Nijni and is on the main road, the building had to be made up to a certain standard which together with carrying out my previous schemes for advertising Ceylon tea there, in an adequate manner, necessitated the additional outlay for which I wired for sanction on 27th April. As this Exhibition is generally expected to be such a gigantic affair and will be visited by such immense numbers of people from all parts of Russia, it seemed good policy in the interests of Ceylon to make the most of this excellent opportunity for bringing Ceylon tea prominently before the Russian public, and I telegraphed to you accordingly. I may mention briefly that among other things, arrangements have been made to supply Ceylon tea in various hotels during the time of the Exhibition and to place placards in the rooms and windows (one hotel which contains 800 rooms will have an advertisement of Ceylon Tea in each room.) I have also secured large spaces for advertisements both inside and outside of the electric trains which are to run all round the inside of the Exhibition, when all is completed, photographs (where possible) and full particulars shall be sent to you.

To the Thirty Committee I must tender my sincere thanks for their prompt and favourable reply to my request. The additional outlay sanctioned will enable me to carry out a scheme which will represent Ceylon Tea in a thoroughly worthy manner at this exhibition.

Thanking you also as secretary for the trouble you must have taken in the matter,—I remain, dear sir, yours faithfully, p.p. M. Rogivue.

(Signed) Hugh C. Dowling.

NATAL TEA SEASON, 1895-96.

The following has been contributed to the *Star*:—the present tea season in Natal will probably close on or about the last week in June. The one before, 1894-95, ended on the 22nd of the same month, the seasons lasting from about the first week of Sept. to the the third week of June, or ten months out of the 12. The picking goes on the whole time with but few stoppages, of which, however, there ought not to be any at all. The remaining two months

of the year are devoted to general outdoor work, such as pruning, deephoeing, manuring, draining, &c. The principal tea district of Natal is, of course, that on the north coast, about six miles from Stanger The nearest railway station is Verulam, about 30 to 40 miles away, but the line will probably pass through Stanger to the Zululand frontier on the River Tugela within three years from date, a result greatly desired by the Victoria County planters—tea and sugar. On the South Coast there are also two tea estates, Barrow Green and Ifafa, both good properties. These, too, will soon be connected by rail with Durban. At present there is not a single working tea estate in Natal on the line. The total outturn of tea for the whole Colony was estimated last September at 960,000 lb. for the present season, or about 100,000 lb. more than season before. The crop, however, will probably not reach over 700,000 lb., on account of the great fire last December, which totally destroyed the Kearsney Estate Central Factory. This estate, which manufactures not only its own leaf. but buys and manufactures the leaf of eleven small out-gardens, under the circumstances is not expected to reach its estimate of 560,000 lb. as it was given out that 100,000 lb. of tea alone were destroyed in the fire. If they have succeeded in making 300,000lb. more at Kearsney only, they will have done remarkably well. Space does not allow of detail, but the conclusion come to is that by deducting at least 260,000lb. (including 100,000lb. destroyed) from the Kearsney estimate, and therefore the same amount from the total estimate for the Colony, the result will be 700,000lb. total out-turn of tea for Natal season 1895-96. Besides the drought, locusts have been a source of loss and vexation of spirit to the tea-planters. Fortunately, locusts do not touch tea, at least not the young tender shoots used for picking, though they have been known to nibble at the older and coarser leaves. It is a good thing that there is so much else eatable that strikes their fancy more in Natal, as, if they did take a liking to the tea-leaf in general, then good-by to the industry as long as locusts were about. The danger exists, nevertheless. It is to be hoped that no fire, or drought, or hailstorm, or other evil will interfere with the welfare of the very promising tea industry of Natal during the coming season 1896-7, and that the planters will reap fully the benefit from their labour, especially the smaller ones, who without capital, have worked hard and pluckily for some years, and certainly deserve all the success they can get. With favourable weather, such as the Stanger district was blessed with in 1894-5, and on ill luck or accident, the turn-out of the whole of Natal should easily top the very respectable figure of one million pounds of tea for season 1896-7. Let us hope then that increased quantity with improved quality will be the result next June year.—*Natal Mercury*, May 15.

INDIAN PATENTS.

Specifications of the undermentioned inventions have been filed under the provisions of Act V of 1888.

Improvements in the trays or carriers of apparatus for exposing tea, coffee, &c., to the drying or other action of air, vapour or gases.—No. 66 of 1896, —Samuel Cleland Davidson, merchant, of Sirocco Engineering works, Belfast, Ireland for improvements in the trays or carriers ot appartus for exposing tea, coffee, &c., cocoa, grain and other substances to the drying or other action of air, vapour or gases. (Filed 22nd May 1896.—*Indian and Eastern Engineer*, June 13.

THE PRODUCTION OF COFFEE AND TEA IN BRITISH DEPENDENCIES.

TO THE EDITOR OF THE TIMES.

Sir,—There is a great deal of misapprehension current in reference to our old Ceylon staple, coffee, its production and price—which, with your permission, I should like to correct. The other day Lord Stanley of Alderly, addressing the House of Lords, included "coffee" in his list of products suffering from depreciation of price, although for the past eight years at least coffee has been pre-eminently the tropical product which, contrary to the theory of bimetallists, has not only maintained but increased its gold value in the markets of the world. Thus, in 1889 the lowest and highest quotations for middling plantation coffee in London were 91s to 102s, and they have not since fallen below that figure, while for 1895 the range was 100s to 107s, and there is little difference this year. This is due to the fact that production has not kept pace with the demand for the Continent of Europe and North America; and yet here again a curious misapprehension prevails as to there being an immediate risk of the over-production of coffee as of tea. Thus, at the recent reading of a paper before the Royal Colonial Institute on "The Development of Tropical Africa," by Sir George Baden-Powell, in the discussion that followed, Dr. Morris, of Kew, stated that "in the regular cultivation of coffee, cacao, cotton, kola, and fruit, West Africa has a great future before it." And in describing the coffee industry in the Nyasa hill country (British Central Africa) I made the remark:—"The chief staple, coffee, is one of which there is no fear of over-production at present." Nevertheless, the chairman (Sir R. W. Herbert) in summing up and referring to tropical products, said:—"It is desirable as far as possible to seek for new staples rather than to crowd the markets with ordinary produce like tea and coffee, which seem in danger of being ovet produced."

Sir Robert Herbert is correct as regards tea, but he has overlooked the great falling off in the production of coffee within British dependencies during the past 16 years. This has been mainly due to the terrible effects of a fungus enemy on the coffee of Ceylon, a great part of Southern India (and even of Java). Without going into details, let me venture to give approximate and contrasting estimates of coffee exports from British dependencies:—

	Maximum annual export 16 to 18 years ago. Cwt.	Estimate for 1896. Cwt.
Ceylon	1,100,000	50,000
South India ..	450,000	240,000
West Indies ..	150,000*	80,000
Straits and North Borneo ..	—	30,000
	1,700,000	400,000

This indicates a woful deficiency, and I see no prospect of more than a very limited increase for many years in the above dependencies. I am free to confess that at the same time Brazil has maintained and even increased its large production of coffee; but this has been counterbalanced by the notable falling off in the crops of Java and Netherlands India generally; and were it not that American and European capitalists have been developing coffee plantations in Mexico and Central America (Guatemala, Costa Rica, &c.), the consuming markets would have been barely supplied. The continued high price has, indeed, encouraged Ceylon tea planters to invest surplus capital in a new coffee district in East Java; while I am aware that City capitalist are looking to foreign States in South and Central America for coffee investments.

Surely, then, experiments in coffee cultivation may well be encouraged in the British divisions of Africa (as well as in the Malayan Peninsula, North Borneo, &c.), and more especially in British Central Africa under Sir Herbert Johnston's enlightened administration. The first limited company for coffee cultivation in Nyasaland was formed a year ago in Ceylon by planters and merchants, whose manager, now

* The West Indies attained their maximum early in this century, Dr. Morris telling me that Jamaica alone exported 260,000 cwt. of coffee in 1805, while other islands—Barbados, Antigua, Dominica, Montserrat, St. Kitt's, and the Virgin Islands—made up as much more, or, say, from 500,000 cwt. to 600,000 cwt., at the maximum about 90 years ago.

hard at work opening up a plantation, gives an encouraging report of his prospects in labour supply, crop, &c.

It will be a long time. however, before such enterprise, or any other enterprise at present within British territory, can seriously affect the coffee market; and I see no early prospect, in any other quarter, of an over-production of coffee. The case is rather different with tea, in view of the large areas planted and still being opened in India and Ceylon. The export of tea from India has steadily risen, year by year, from 2¼ million pounds in 1861-62, until the estimate for 1896-97 is 141 million pounds. In the case of Ceylon we began with 23lb. export (23 years ago) in 1873, and for 1896 the official estimate of total export is 102 million pounds.—I am, sir, yours truly,

J. FERGUSON, of the *Ceylon Observer* and *Tropical Agriculturist.*

Royal Colonial Institute, Northumberland avenue, London, W. C., May.

UNFORTUNATE FLORIDA.

It is only after a visit to Florida that one appreciates the disastrous efforts of the freeze of last year. It is the constantly-recurring topic among residents. It left behind it ruin, misery, and blasted hopes. Many persons had invested the savings of a lifetime, all the money they could borrow or scrape together in groves and plantations of one kind or another. Some had even mortgaged the growing crop to tide them over, expecting to find themselves on the road to fortune when it was harvested. Then the labor, expenditures and efforts of years were literally wiped out in a night by the cold wave which killed off the growing things and left the land as unproductive as it was before cultivation began. It was a blow from which many settlers cannot recover, to say nothing of the pecuniary loss to the State at large. The extent of it has not really been measured yet, for it is possible that time may show that the injured orange and coconut groves and other plantations must all be planted over again, and the process of cultivation begun again from the start, a matter involving years of toil and expenditure. People in Florida talk hopefully of the prospects, but there are many estates for sale and many settlers are eager to sell at any price that would enable them to set North again. A shrewd, hard-headed Vermont farmer came, through a complicated real estate trade, into possession of a plantation in the orange belt upon which the owner had spent $6,000. He offers the property at $1,000, and says privately that he would gladly accept $500 cash for it. He even regrets the cost of the coat of paint which he put upon the house to make it more attractive to possible purchasers. Property, of course, will rise in value in time; but this farmer's experience is said to be a fair illustration of the condition of real estate in Florida.—*New York Sun.*

THE LONDON CINNAMON SALES.

The last mail from London has brought fairly cheering accounts of the quarterly sale of cinnamon, which should have been held on the last Monday in May, but which came off on the 1st June as the 25th May was included among the Whitsuntide holidays. The sale was in most respects a satisfactory one. The quantity offered was not unusually large, but, like the offerings at the previous sale in February, was a fair average quantity. In all, 1,743 bales were put up for competition, being a little less than the quantity offered in February, when 1,792 bales were catalogued, and the better part found purchasers. The quantity, however, was in excess of that offered at the corresponding sale last year, when only 1,065 bales were down in the catalogues and the whole found purchasers. But from the table of exports one might have expected even a larger quantity yet, as the current year shows far heavier exports than the four preceeding ones—perhaps than any previous year. Of the 1,743 bales offered, more than two-thirds, viz. 1,292, were disposed of under the hammer. The competition left little to be desired; for although the fine qualities sold at a decline of half a penny to one penny, the bulk which consisted of ordinary cinnamon, commanded fair competition and even advanced to a slight extent. Thus, whereas, at the February sales, A S G P (Golna Pokuna) fetched up to 1s 5d per lb., at the sales on the 1st inst., this well-known mark did not command a higher price for its firsts than 1s 4d. The next highest prices realized were for spice from W.S. and K. from the wellknown F. S. Kadirane group; and these fetched up to 13d; but the ordinary cinnamon advanced a penny.

In commenting on the February sales, we drew attention to the fair competition which "unworked" cinnamon commanded. Even a couple of years ago such cinnamon would scarcely be looked at, because it had failed to pay the exorbitant charges imposed by the dock companies for the wholly needless operation—at least as regards the well-known marks—of having every single bale cut open and restoring after the removal of broken quills. As in the February sales, so at the last, a very considerable quantity of "unworked" found buyers. Among the most prominent were the C. H. de S. (de Soysa) marks, which sold according to the grades, from 8½d to 10½d. It is not a small advantage that unworked cinnamon is now fairly competed for; but there is special ground for satisfaction in the keener competition which ordinary cinnamon commands. We interpret this as evidence that new uses have been found for our spice through which the disadvantages under which cinnamon so long laboured, of overproduction, are being overcome. Another hopeful future is that broken quills and clippings fetched as high as 9½d a lb.—an advance of about 50 per cent. over usual prices. Altogether therefore the sales must be regarded as satisfactory, and promising well for Estate Proprietors. The following is the Report on the last sale from one of the leading firms in the spice trade:—

London, 2nd June, 1896.

CINNAMON.—At the quarterly sales held yesterday, 1,743 bales Ceylon were offered, against 1,792 bales in the February auctions, and 1,063 bales at this period last year. There was a steady demand, and 1,292 bales were cleared under the hammer; ordinary and medium quill realising full to occasionally dearer rate, while fine quality sold rather irregularly, but mostly at ½d to 1d per lb. decline on the prices ruling in February. About 400 bales worked sold; firsts sold, good to fine from 11d to 1s 1d; seconds, good to fine 10d to 1s 2d; thirds, 10d to 1s 1d, and fourths, 8½d to 10d per lb. The unworked quill—about 900 bales—brought, firsts, 10d to 11d; seconds, 9d to 10½d; thirds, 9d to 9½d, and fourths, 8d to 8½d per lb. Chips sold at 3d and clippings up to 9½d per lb.

The London Warehouse Stock is 3,173 bales against

in 1895	1894	1893
Bales.	Bales.	Bales.
3,306	3,218 and	3,699

The next auctions are fixed for the 31st August.

HANTANE, OLD AND NEW.

The district of Hantane, though not the oldest, largest, nor most important of planting districts, must always have a peculiar interest attached to it. It contains the beautiful capital of the Central Province, and every estate has its history and associations more or less interesting to all old Ceylon men. Apart from this it is one of the healthiest of localities, and what is more was on the whole ever a paying district in coffee as it promises to be in tea. Things are not always what they seem, and Hantane is better than it looks, which is more than we can say of most places or some men. Looking up from Kandy the cursory observer, seeing the sparsely covered ridges, would not be prepared to hear that the returns per acre have ever been fully equal to those of the more sheltered upland valleys. Yet such is the case, while the proximity to Kandy adds a certain value to all the landed property in the vicinity. Even supposing there was no tea there are other strings which one could stretch—if need be—for a livelihood.

Walking down the Windmill brae of Aberdeen one day with a well-known proprietor whose estates lay within easy access of the mountain capital, I observed him lifting his hat to a poor old woman who was chopping up firewood for sale. "Who's your lady friend?" I asked. "Don't know," was the reply, "but we are both in the same line of business"! It was during the dark days of coffee when this means of tiding over the bad time suggested itself, and brought him in a few hundreds a year. And there are many other items which could here be turned to account though not necessary to enumerate while tea is tea.

It would be difficult perhaps to find another estate in the Island that has given better returns in its day than old Hantanne itself. Opened in 1838 by Messrs. Atchison and Jefferson it was the first systematically cultivated and clean weeded of coffee estates, and for many years this estate well repaid all the care bestowed upon it. The collapse of coffee came upon the just and unjust, but even then Hantanne was not worked at a loss, while now again its prospects are of the very brightest.

After the retirement of good old Jamie Martin from the management of this estate in 1858, a strange series of disasters befel its superintendents—one was supposed to have been poisoned, another was certainly shot dead, while a third went stark mad. Since then matters seem to have got into a smooth groove again, and tea is doing very well.

A better known estate was perhaps Odewelle adjoining. This fine property may be said to have been the Lippekelle of old, realizing in 1845 the record price of the day (£15,000),—a fact which led to the mad rush and ultimate collapse' No. 1. When first we passed through Odewelle, good old 'Know best'—really then at his best—was superintendent glorying in his fine herd of cattle—all of which he knew by hip and horn, and all knew and loved him. A hospitable host was Willie, and many a good Willie waucht did the thirsty traveller enjoy at his bungalow. After him came a Willie of a different jât, but the estate went on prospering and giving good returns till Collapse No. 2 of the early 80s. In tea Odewelle has not yet quite come up to the position it held in coffee. Tea takes time to accommodate itself to the best of old coffee land, but it promises well.

Let us now once more pass through the gap to Kitoolmoola where first we met that typical planter of the middle ages A. C. Mortimer, the trusted and eminently trustworthy manager for Sir John Cheape. Kitoolmoola and Gallaha were model estates carefully cultivated and gave spendid returns to the lucky proprietor at home; but alas the days of even careful A. C. Mortimer drew to an end. He stayed the year too long on the much loved totum, and died at Southampton while *en route* for the dear auld hame. He was succeeded, however, by a most capable man, whose hard and shaggy head contained, and still contains I am glad to say, brains enough to accomplish anything he cared to undertake. Under his management the properties continued to improve till sold to the present proprietors. The tea here is now giving most satisfactory returns, and the splendidly equipped and well managed factory on Gallaha is one of the sights of the island.

Fain would I push further down to where I first called upon T. Gray, now of Bunyan fame, or round the corner to Nilambe where the far-seeing "eye-glass" received me so well, and on to Warriagalle where the hospitable Henderson reigned, or down where I was wont to spend the evenings with the most congenial of Davidsons; but this must suffice for today. And we must now return northward passing over the ridge from Odewelle into Hopewell, of which it used to be remarked in 34 Craven St. that it formed "the most comfortable of accounts"—always on the right side. It now belongs to Mr. S. Agar, its former superintendent, but as yet only a small portion has been planted in tea. Mount Pleasant, adjoining, still belongs to the old owner, and though the best portions are still to plant tea is doing remarkably well. It will however take a long time to come up to the splendid returns of old coffee days, when £8,000 sterling was netted from 400 acres! And be it remembered had the rupee been then at 1s 2d the profits would have been nearer £14,000 per annum. Tea has indeed a big margin to make up before it beats the old king.

I shall now only notice, on the way down to Peradeniya, the quoudam and favourite abode of clever, capable, Sandy Brown, Bellevue, as he delighted to call it, but now known by the less appropriate name of Augusta. Would that Sandy was here today to witness the change! The neighbourhood presents few more satisfactory transformations than this. As a coffee estate it was one of the very poorest and least remunerative in the district, its quartzy ridges eating up all the manure that Kandy or Getambe could supply, with the result of only a few additional leaves. Now see it closely clothed in luxuriant tea of the best jât, while that grandest of exotics, the Grevillea, adds yearly to the improving soil. Truly tea is a hardy though eccentric plant, often growing best where least expected and sometimes—as we will see in my next—refusing to take root in the richest soil.

Yes: I could wish Sandy had lived to share in the prosperity of this now very profitable property. I have always thought his fate one of the saddest in Ceylon. Worried and bled by relatives at home, distrusted by his old friends in Ceylon, many of whom he had helped to make—he passed away neglected, crushed, and starved, when, as usual, the friends came forward, and gave him a stone.—*Cor.*

CULTIVATION OF RHEA.—The Government of India, it is stated, is likely to take steps to investigate the cultivation of the rhea plant. An enormous demand for the fibre has sprung up in England. By a new process of manufacture, excellent fabrics can be woven from rhea and the industry seems to have a great future before it.

THE RUBBER SITUATION IN MADAGASCAR.

Madagascar as a source of India-rubber is destined no doubt to become largely more important. The exports of rubber from that island have fluctuated from year to year, sometimes declining so far as to induce fears of the early extinction of the yield, which were strengthened by reports of the destructive methods of the rubber-gatherers. But again the output has increased, while each successive traveler returning from Madagascar has thrown new light upon the extent of the rubber forests. Some facts of interest in this connection have been supplied to The India Rubber World by Mr. John L. Waller, some time United States consul at Tamatave, who has lately returned to America after his release from a French military prison, his troubles having grown primarily out of a concession to him of valuable rubber lands by the Malagasy government without consultation with the French authorities.

This large island is covered, for the greater part, by virgin forests throughout which, so far as foreigners have made their way, India-rubber vines and trees abound. By the way, most authorities have attributed the Madagascar rubber to vines of the genus *vahea* (similar to if not identical with the *Landolphia* vines of continental Africa), but, according to Mr. Waller, a more important source of rubber is a large tree which he has not been able to identify botanically. This tree often grows to a diameter of twelve to eighteen inches and in such numbers as to make the ground seem almost bare after the reckless rubber gatherers have gone over a strip of forest with their axes. A peculiarity of the tree which Mr. Waller reports to have seen personally is that the roots are not killed by the felling of the trunks, but that new shoots invariably spring up, becoming large enough in a few years to yield rubber. Thus the extinction of the supply is provided against by nature, which is not true of the Pará rubbers or the *Landolphia* climbers. The tree likewise grows readily from the seed.

The usual practice of the native rubber-gatherers is to proceed to the forest in gangs, armed with axes for felling trees and galvanized iron buckets for catching the sap. The fallen trunks are chopped or sawn into lengths of three or four feet and supported over the buckets until all the rubber sap has drained from the bark. Mr. Waller reports having seen two quarts or more of sap yielded by a single stick of wood. Coagulation is effected by stirring a few drops of acid into a bucketful of sap and allowing it to stand in the sun for several hours. There is as yet practically no proprietorship in the lands, and the rubber-gatherers have been free to wander at will in the forests. But the governor of the province in which Mr. Waller's concession is located has orders from Antananarivo to prohibit trespassing upon it after the limits shall have been surveyed, and the next step will be to put an end to the destruction of the trees.

The concession covers 144,000 acres of forest lands, to be located in the best rubber district in Madagascar, which is in the southeastern portion, including the old French station, Fort Dauphin. This has been the chief place for working rubber on the island, and, as it is distant from any consulate, and, as the English and French traders are secretive about the extent of their business, doubtless not a little rubber has been exported to which no record ever reached the various consults stationed at Tamatave. Rubber near the coast began to be scarce several years ago, but the natives asserted that more was to be found farther inland, and now the seat of the industry has been removed to a district about three days distant from Fort Dauphin. Twenty-two dollars are paid there for a hundred-weight of rubber. Fort Dauphin has been styled a halfway house between Europe and the Orient, and it is now a port of call for the Castle mail Packets Co., Limited, and another line of steamers. There are from two to four ships and sometimes more per month in the harbour. The climatic conditions at this point are good, the lands are fertile, the cost of living is low, and a consideration which induced the Hovas to grant this concession was that it might lead to immigration from Mauritius and elsewhere and the development of various industries at Fort Dauphin.

It is the belief of the *concessionaire* that the district would be well fitted for colonization by Afro-Americans, who would find there better advantages for trading than they enjoy in the United States. The Hovas are an educated race, and foreigners from several countries have made fortunes in trading with them. Mr. Waller will attempt to find means in this country for developing his concession, the status of which, he claims, has not been changed by his troubles with the French authorities. In what light it will be viewed by the latter, however, remains to be seen. He believes that a field exists for a much wider direct trade between the United States and Madagascar. While the foreign traders have been mainly English and French, the American house of Ropes, Emmerton & Co., of Salem, Mass, long and had a successful career at Tamatave, retiring from the trade during the troubles growing out of the late French war. The house of George Ropes, of Boston, entering the trade later, is now established at Tamatave, Vatromandry, Antananarivo (the capital of the island), and Finanarosa. A large business is done in the selling of American cotton goods to the natives.

The British and American imports of Madagascar rubber, which presumably include almost the entire output of the island, have been of late years as follows:—

UNITED STATES.	Pounds.	GREAT BRITAIN.	Pounds.
1891-92	.. 174,919	1890	.. 624,848
1892-93	.. 275,331	1891	.. 729,232
1893-94	.. 265,411	1892	.. 996,240
1894-95	.. 31,003	1893	.. 1,040,920
		1894	.. 981.816

There must also be taken into account the British imports of rubber from Mauritius which are mainly derived from Madagascar, and which amounted in 1894 to 168,336 pounds. Altogether, the official figures available point to an average annual output of Madagascar rubber in recent years of 1,162,000 pounds. If it be true that the supply is practically unlimited, the ever-growing commercial spirit of the age, the increasing means of transportation, and the utilitarian spirit which must inevitably stop the waste of trees, will without doubt combine in largely and permanently increasing the yield.

Madagascar rubber is classed in the markets as "pinky" and "black," the former being the more valuable. When asked whether one kind was probably yielded by trees, and the other by vines, Mr. Waller replied that he could not say.—*India Rubber World*, May 10.

THE CLIMATE OF MID-AFRICA.

Mr. Scott-Elliot, in his account of his journeys in Mid-Africa, says of the Ruwenzori range that the highest peaks are almost perpetually hidden from view by mist, which in the morning covers the lower slopes, and appears to rise at the rate of about 1,000ft an hour. The upper limit of forest is given at 9,000ft, bamboos at 11,000ft, whilst heather reaches 15,500ft, at which snow begins. The climate is divided into four zones of altitude — the coconut or oil-palm zone below 3,000ft, the coffee zone between this and 5,000ft, the colony zone from 5,000ft to 7,000ft, and the cloud belt above 7,000ft. The Ruwenzori region is stated to be a more promising coffee and tea region than even the Shiré highlands. For colonies the Masai uplands and the Stevenson Road plateau are the most recommended. —*H. and C. Mail*, June 12.

TEA PLANTING IN DARJEELING.

PAPER TO BE READ BEFORE THE INDIAN SECTION OF THE SOCIETY OF ARTS ON THURSDAY, MAY 14TH, 1896.

BY GEO. W. CHRISTISON.

My first duty—which is a pleasing one—is to thank the committee of the Indian Section of the Society of Arts, for having done me the honour of inviting me to read a practical paper on tea. As the history, progress, commercial aspects, and complete statistics of the industry have been exhaustively dealt with by others, I shall best employ the time allotted to me this afternoon by giving a brief outline of the culture and manufacture of tea in Darjeeling, with some suggestions on a few points of vital importance, referring to that district in particular and the industry generally, drawn from my own observation and experience.

The annexation of Darjeeling (strictly British Sikkim, and British Bhutan, exclusive of the Dooars) is but a comparatively recent chapter in the history of the extension of British rule in the East. Until 1815, when the country was brought into notice by the Goorkhas invading the territory of the Raja of Sikkim, that district was practically a *terra incognita*. This led the East India Company in 1816, at the close of our war with Nepal, to espouse the cause of the Raja, and enter into a friendly treaty which constituted Sikkim an independent state under British protection. In 1835, 138 miles of Sikkim were ceded to the East India Company for a sanitarium for Bengal, in lieu of which an annual allowance of £300 was granted. In 1850, after the Sikkim war, some more hill territory and also the Terai were added, the subsidy, however, at the same time being enhanced very materially. And in 1865 the hill district of Daling was annexed from Bhutan as the outcome of the expedition of 1864, and the war with that state just then terminated.

The district is mainly situated on the lower and outer ranges of the Himalayan mountains, but as stated, includes the Terai which is an unhealthy level sub-montane tract of forest, or what was up till 30 years ago almost uninterrupted forest. It is bounded on the east by Bhutan, west by Nepal, north by independent Sikkim with Tibet beyond, and on the south-east and south by the Dooars tea district and Purneah in Bihar, and extends from about 26deg. 30' to 27deg. 13 N. latitude. Though in area it hardly exceeds that of a second-rate English county, it ranges in elevation from about 350 feet to altitudes of over 12,000 feet above sea level. The town, or as it is called the "station" of Darjeeling, which is the administrative headquarters of the district, as well as the health resort for the Government and residents of Bengal, is charmingly situated on a ridge at an elevation of 7,167 feet, commanding a magnificent view of the "snowy range" (about 40 miles distant and rising to over 28,000 feet), and to the north of Calcutta 379 miles by rail, but somewhat less in a direct line. Any attempt to describe the magnificent and sublime scenery is, fortunately, outside my province, as it is altogether beyond my powers. It is impossible for me in words to convey even any adequate idea of the steepness and irregular configuration of this mountain territory to those who have not visited it, though this feature must not be lost sight of in our consideration of the main subject of this paper. The mountains do not rise by any series of inclined planes or uniform undulations to their summits. The main trend of the ranges is towards the "snows" —generally from south to north—and of the torrents and rivers in the opposite direction from the snows towards the plains, but there are also side branches of importance running east and west (one of those, the Little Rungheet river, actually flowing north-east, and the adjacent mountain ranges ascending south-west), and many minor spurs and streams are in the very opposite direction to the main ones. On this account, the interior of the hill district generally presents a somewhat confused labyrinth of ridges and valleys. A considerable proportion of the hill area is so precipitous as to grow nothing but scrub or an occasional tree in the crevices of the rocks, and much is unfit for tea or cultivation of any description; but the soil on the gentler and some of even extremely steep slopes is good and of surprising depth, considering the situation. As a rule, the best soil on the hills is found from 2,500 to 5,000 feet; that below 3,000 feet is generally dry, and the tea thereon more subject to blights. Elevations over 5,500 feet are rather cold for tea—certainly for its rapid growth—though it is to be found thriving and doing fairly well from 6,000 to even 7,000 feet. Owing to the extreme steepness and irregularity of the ground, the roads have to be laid off in zigzags of greater or less length, when, as is the rule, an ascent or descent has to be made, or in sharp curves where contouring more levelly round ridges and into the identations. This renders the length of roads from place to place out of all proportion to—not unfrequently over twice, and occasionally almost three times as great as—the distance as the crow flies. The district government roads are, as a rule, at gradients of 1 in 9 to 1 in 7, and are from 10 to 7 feet wide.

As stated, owing to the zig-zag and winding nature of the roads, and the wide intervening spaces of forest and jungle, the length of the roads is very great, in proportion to the cultivable and rateable area, especially as the Forest Department does not pay road or public works' cess, and the vast tracts of native cultivation nothing directly and next to nothing indirectly. In my time, the local railway was also exempted. For these reasons, as well as on account of the district being a frontier one, containing a military station and sanitarium, it has special claims for "grants-in-aid" towards its roads and bridges, in regard to which, it must be admitted, Government has, on the whole, been liberal, sometimes especially so. Yet I hold that, in justice, as well as viewed as a fair and legitimate matter of account between the Government departments, a great landlord like the Forest Department of India, claiming a large clear revenue annually, ought to be charged both land revenue and road cess. Incalculably valuable as this department undoubtedly is to India, profit should not be its chief aim; and such a step would cause the department all the more adequately to realise its immense responsibilities in holding such vast territories.

But, in addition to locomotion and soil, this rapid and great variation in elevation affects the climate, health, and working capabilities of the inhabitants, native and European, vegetation, humidity, and, to some extent, the quality of the tea, to which allusion may be made hereafter.

The rainfall varies greatly throughout the district. At the "station" the average is about 120 inches, and on the tea-gardens (at lower elevations) it ranges from 75 to 135 inches and even over annually. The defect for tea in regard to rainfall is that it is not sufficiently distributed—the dry season being too long, but worst of all too little rain falls in spring and too much during three to four months from June to September, when it is too frequently accompanied by dense mist often obscuring the sun for a week, sometimes more, at a stretch. There are also not unfrequently sudden heavy downpours which have been known to amount to ten inches and more in a single night. These downpours as well as considerably heavier annual rainfalls than have been named are more characteristic of the outer ranges. The mean temperature of the "station" of Darjeeling is only a couple of degrees above that of London, but that of the tea gardens is of course much higher. In the Terai and confined valleys under 2,000 feet on the hills it is quite tropical and often stifling. At elevations of 4,500 feet the temperature seldom exceeds 85°, the mean maximum about 80°, and at elevations of 3,000 feet it occasionally turns 90°, with a mean maximum of about 85° in the shade during the hot months. The mean maximum in the shade in winter is about 60° at 4,500 feet, and 67° at 3,000 feet. The difference between the mean maximum and the mean minimum varies from 15° to 20° and more in winter than summer, and at high than low

elevations. As registers have been kept since 1866 for the company I served in Darjeeling for thirty years, and for the last eight or ten years at no less than eleven stations, at various elevations from 1,400 to 6,300 feet, the statements in the appendix are given to avoid further details here.

The latest complete Government returns that I have been able to obtain give the entire area of the Darjeeling district as 1,234 square miles, about equal to that of the county of Stafford. The old hill territory, containing the well-known tea gardens, is put at 477 square miles, the Terai at 271, and the Daling-hill district at 486 square miles. Of the whole, 438 square miles were returned in the possession of the Forest Department, 397 miles as held by native cultivators for cereal crops inalienable for tea as far as the hills is concerned, 70 miles had been allotted to the Government Cinchona Department, and 329 square miles as grants for tea cultivation. It will, therefore, appear that but one-fourth of the whole has been allotted for tea, and that certainly not more than one-thirteenth or about seven and a-half per cent of the entire district is actually bearing tea at the present time. From information kindly furnished by the India Office I find the area of the district is now stated to be 1,164 square miles, and the difference may be due to the portion marked off and include in the Dooars district some years ago. I am also of opinion that for tea, transfer of some of the land returned as above for native cultivation may have taken place in the Terai. Yet if this be so, the proportion of the tea grants would not be greater than stated. Seeing the Census of India Report, published in 1893, gives 212 square miles as the area held for tea estates, I cannot be charged with any desire to understate the proportion allotted for tea. Hardly any land on the hills suitable and available for tea remains unplanted.

The more recently acquired district of Daling may be taken as about equal in extent to that of the entire original Darjeeling hill territory, and generally comprises much gentler slopes. Of this 250 square miles are returned as made over to the Forest Department, 30 as retained by Government for cinchona, and 141 consisting of beautiful slopes, most desirable as a place of residence for Europeans, and as suitable a district for European colonisation as can be found anywhere in the East, has been reserved by Government for natives, and is now largely in the possession of Nepalis who are aliens, and a smaller proportion of aborigines and semiaborigines. About 65 square miles of this sub-division was reserved for tea, but so unsuitable was it that, notwithstanding the eagerness for tea grants, especially in the hills, only about eight or nine square miles had been taken up when I left India in 1893, and hardly more than about 1,200 acres altogether have been opened out. These new gardens adjoin the Dooars, and may be said to belong to that district rather than to Darjeeling.

The late Dr. Archibald Campbell, who was an active and enthusiastic member of the Indian Section of this Society, was the first resident Government official at Darjeeling, and did much for the district in its early years. He was removed from the residency at Nepal to be superintendent of Darjeeling in 1840, and in 1841-42 he made the first trial of growing tea in the district. He continued his experiments, and in 1847 had the plants raised, reported on by a gentleman from Assam, which fully confirmed him, in the opinion that tea could be grown successfully on the hills. Seed was distributed by Government to several residents most likely to do justice to it, and experimental plots of a few acres were planted out in different localities, about 1856; and in 1857—or it may have been a year earlier as asserted by some—the first tea garden, on an extended scale or commercial footing, was started at Alloobaree by Major Samler. In the Terai, though experimental plots were planted earlier, the first garden (now known as Chumpta, near Kaprail) was opened out by Mr. James White, one of Darjeeling's pioneer planters, than a most energetic man, who had previously planted, in the course of two seasons, very successfully, Singel, near Kurseing, still one of the largest, if not the very largest, of our single hill gardens. Darjeeling has since grown gradually in importance as a tea-producing district and in other respects. At present there are about 180 tea gardens in the district, extending to about 55,000 acres under plant, giving employment to not less than 70,000 natives, excluding children and other non workers.

According to the last census returns, the rapidly-increasing population of the district was 94,712 in 1872, and 223,314 in 1891. Of the latter, 88,021 were stated to be residents who were actually born in Nepal. This being so, the Nepali population of Darjeeling who have immigrated at one time or another or been born in the district, can hardly be less than 160,000.

Tea is certainly the staple, if it may not claim to be the only, Darjeeling industry, and to say the least, has done much for the district. The 1895 crop amounted to 10,771,117 lb. of which most went home, contributing considerably to the exchequer, benefiting trade in many directions, and supplying nearly all the return traffic to the local railway, at highly remunerative rates, considering it is conveyed downhill mainly by gravitation. Very little produce of any kind is exported, or even supplied to the district, from the native holdings.

In regard to my main subject, the first point requiring attention naturally should be the selection of a site for a garden. This is a matter of vital importance, and calls for the exercise of much judgment and experience, and often exhaustive labour in exploiting. The soil may be looked upon as the constitution, so to speak, of a garden upon which its prosperity and staying power mainly depend, and its selection, especially as the subsoil, to a great depth, is of importance with a deep-rooted plant like tea, involves no light responsibility. Besides a wholesome water supply, forest, water-power, and, in the plains, immunity from flooding should all if possible, be secured. But as this can no longer concern Darjeeling hills, it need not here be dwelt upon at length. Though I have been concerned with the opening-out of gardens of considerable extent on Darjeeling hills, I have never had the responsibility of the selection of the grants for them, but have merely had to endeavour to make the most of the ground at my disposal. The original Darjeeling gardens were, as a rule, selected and opened out in a creditable manner, considering the experience of the time. During the mania of 1863-64 extensions were pushed on upon risky and unsuitable soil, beyond the labour and experience available, the land was very imperfectly prepared and planted; there were difficulties about seed; seedlings had often to be carried long distances, necessarily resulting in failure and consequent abandonment for a time. A proportion of the land then abandoned has gradually been re-opened successfully under more favourable conditions. If a grant of land has still to be selected on the hills, the most important consideration would doubtless be to secure a soil that would yield quality, and varying in elevation from 3,500 to 5,000 feet. All aspects grow tea almost equally well; and though the southern and south-eastern are drier and more difficult to plant successfully, they are, upon the whole, preferable when opened out. The northern aspects require less care and less skill, and are not risky for vacancies, but have comparatively more in their favour at low, dry altitudes than high. Though gentle slopes are undoubtedly preferable, they have generally, on that very account, been much more under native cultivation; and, contrary to the expectations of many, the steeper—often extremely steep—ground grows the better teabushes. It should here be noted, in regard to these hill-sides, that it is very difficult to get tea to thrive upon the sites of homesteads, and that for many years those parts generally remain bald, comparatively bare looking, and an eyesore upon an otherwise successful garden. But I can bear testimony to the fact that such patches, after having been trenched to an unusual depth, kept fallow, and sulphured annually for three years, have afterwards been planted quite successfully the tea bushes flourishing and keeping pace with the body of the garden

from the outset. Further, all land long under native cultivation should be allowed to lapse into jungle, or, as it were, lie fallow for three or more years, and, of course, the longer the better before planting.

The first operation in tea planting is the clearance of the land; it may be from forest, but often upon partially cleared and cultivated or grazing land. In the case of forest toon and a few other very valuable trees, the drip and shade of which are least injurious, should be marked for preservation at considerable intervals. The felling of trees is a work the Nepali is expert at, and delights in, his bump of destruction being highly developed. The trees are sometimes prepared so that the fall of one carries others over with it, and so on continuously down the slope like ninepins, with a crash that resounds through the solitude of the hill sides like muffled thunder. After the storage of useful timber, the next step is the burning, over which there is considerable excitement. This is carried through as soon as the clearance has been duly prepared and become sufficiently dry, advantage being taken of a safe and suitable wind. A great number of coolies have to be in attendance to guard the fire from spreading to property beyond. In addition to wood and other growth there is often numerous bamboos upon the clearance which, when being burnt, crackle and give forth reports resembling the roll of musketry, while the figures of the natives flitting athwart the raging flames, and by times being taxed to their utmost to keep the "burn" within safe bounds, renders the scene a lively one, though not always free from anxiety to those responsible. The burning stumps and heavier bamboos often smoulder for days.

After the fire has died out the ground ought to be trenched and thoroughly cultivated to the depth of 18 inches throughout the gentler slopes, but effectively though carefully and to a lesser depth on the steeper slopes, and in accordance with the degree of steepness—extracting stones and all roots of trees, bamboos, jungle and weeds at whatever cost. On such steep and irregular ground much judgment and ingenuity have to be exercised in order to direct the surface drainage into safe channels to prevent "wash." All except the gentler slopes ought to be carefully terraced. These terraces should not be formed too elaborately, with a deep well behind, and built up sharp angular edges in front or containing two rows of bushes along side as they sometimes do, but merely so as to modify the slopes no more than necessary for the stability of the soil and prevention of wash. This is more simply accomplished if attended to at the proper time and place than it would appear to be. A shallower formation of terrace will interfere less with the capilarity and natural circulation in the soil than the more elaborate. The deeper and more acute angular terraces greatly intensify the defects of the Darjeeling climate. The terraces should also be aligned as far as practicable to direct the surface drainage into safe channels. It stands to reason that the wash should be diverted near its source, and as it begins to accumulate. Paradoxical though it may seem it is not generally the steepest parts that suffer most, but the gentlest slopes even where they assume almost the form of a plateau. This arises from the surrounding slopes having acted as a filter, so to speak, concentrating a rush of water upon such after sudden downpours. The object of surface drainage is to check this accumulation, and the drains should be laid off with a gentle run. The excessively steep portions should be laid off in "spot" terraces, formed in the most advantageous places, to contain one or more plants. The laying off of the estate roads so as to traverse all parts of the gardens, without involving waste of locomotive power, is important, and their alignment should also be such as to aid in the safe drainage—the reverse being easy. This somewhat difficult task, with the skill and experience available in the early times, was not so invariably successful in attaining the perfection and easy uniform gradients as desirable. The prevailing gradients of garden roads, except where crossing the slopes or rounding ridges, are from 1 in 7 to 1 in 5, width 5 or 6 feet; but paths are to be found not more than 4 feet wide, and so steep as to ascend or descend 1 in 3. A sure-footed pony—which the Bhooteah ponies generally are—is indispensable; and passing across precipices with a sheer drop of hundreds of feet upon such roads is trying to the nerves of most unaccustomed to mountain travelling. As has been remarked, the length of road is great in proportion to area. By careful survey, I have ascertained that on a garden of 500 acres, benefiting by the service of a district road zigzagging through its entire length for 4½ miles from top to bottom, the inadequate system of estate roads measured 18 miles, leaving fields of tea very arduous to reach from any of the roads. The Ceylon "road tracer," a simple and inexpensive, but admirable, instrument, is a most valuable aid, to the inexperienced especially, for the alignment of roads, but, in my experience, even more so in the laying off of terraces. Roads generally, like terraces, should have the outward, not inward, slope, but may also have a drain along the inner or hill side when required. The removal of stones, as referred to, might possibly be carried to excess in rare instances, but of this the risk is not great. I have often had this done to an enormous extent, and with an unfailing corresponding advantage on extensions. The stones may be disposed of for buildings, or in forming embankments, culverts, and fords for roads. Besides, when a road passes through good land the rich soil may be removed and spread upon the poorer parts of the garden, and replaced with stones. The remainder of the stones can be built up in heaps upon spots of convenient waste land. The cultivated area has to be lined and "staked" off for planting, and no little ingenuity and care are required to get the points for the plants arranged in perfectly straight lines up and down a steep, irregular hill side, "over hill and dale," and, at the same time, getting them to fall into contouring lines along the terraces, without loss of space or overcrowding. Opinion has always varied, and from time vacillated, as to the distance the bushes should be planted apart, and though there is a guiding principal in regard to this, it may not be well to dogmatise. For the hills, I would venture to recommend 5 feet by 4 feet, 4½ by 4½, and at the closest 4½ feet by 4 feet on the base, but for the Terai greater distance, especially between the rows, to admit of ploughing or horse-hoeing if found necessary.

There are two modes of planting, the one from nurseries by transplanting, the other by putting down the seed germinated or fresh in *situ*, or, as it is termed, "at stake." Each has its own advocates and advantages, but in the climate of Darjeeling the former is preferable; besides, two paramount advantages may be claimed for it anywhere—namely, five or six months more are available for the thorough preparation of the ground, and it admits of the perfect selection of the most vigorous seedlings of the best and of uniform variety. Moreover, from my own observation, I have often been disposed to doubt whether the quality of the produce is not improved by the transplanting. This may not be so, but I have been at a loss otherwise to account for the different quality of tea in adjoining gardens on similar soil, and under varying management. This is a matter I would recommend to practical men, as worthy of being determined by systematic experiment. If the transplanting is to be adopted, an extensive and elaborate system of nurseries is essential. For nurseries, the most advanced garden cultivation, constant care and attention is indispensable—watering in most instances, and shading in hot-exposed situations being needful. The nurseries should be numerous, and practical, in or near all parts of the proposed extensions, for economy in the carriage of the seedlings. The seed beds must be thoroughly freed from stones, and the seed should be sown rather wide apart especially when machine planting is to be adopted. Though 4 inches by 4 inches may seem too close, judging from what is generally written, that in practice will be found to work out satisfactorily, the early and first seasons's operations thinning out, and giving space for the young plants that remain.

The seedling are generally removed from the nurseries at the age of from six to eight months. They should be transplanted with balls of their own earth attached to their roots, and this can be acomplished to great perfection by Jaben's patent transplanter, an ingenious Cachar invention, simple in operation, handy, costing a mere trifle. All risky dry aspects should be planted by this means, and also during the most seasonable and favourable season and weather. Most northern aspects, unless during unfavourable weather or towards the close of the season, may be planted very successfully by hand with a lighter quantity and less perfect ball of earth attached, at a saving of labour. By this method the seedlings receive no check to their growth, while those put out in the old ordinary defective way, without earth attached, with difficulty exist during the ensuing dry season at the best five months in duration—some years, even eight months, from October to May inclusive. With land thoroughly prepared and planted out as referred to, though much more costly the first year, this will be more than compensated for in the saving upon the cultivation in subsequent years; while, it may be safely asserted, that as good growth has been obtained in three years in this way as was common during five years under the ordinary method.

It must readily be perceived that the judicious cultivation of such excessively steep ground must be a matter of vital importance. The utmost foresight, ingenuity, and care are necessary to prevent the soil from being carried downhill, not so much in the process of hoeing itself, as by the action of the heavy rainfall, especially the sudden down-pours early in the rainy season. Forking is much less dangerous for injuring the roots of the tea, and is much safer for hill cultivation than hoeing with the country *kodalie*. Moreover, the straight digging fork admits of the labourer standing upon the unturned ground, and turning or tossing the soil up hill; while in hoeing he reverses the process, by trampling the ground he has just cultivated, and dragging the soil down the declivity. Cultivation by means of the straight digging fork was first advocated and experimented with in Darjeeling by the late Mr. John Stalkartt. Forking was resorted to on a large scale by me 23 years ago, and is now pretty general, the hoe (*kodalie*) being only used in the preparation of extensions, road-making, and the like. It is, however, decidedly, more costly than hoeing, which is a consideration, when labour is scarce. and many hundreds of acres are entirely under spade industry, so to speak. The deepest and most important cultivation of the year is the cold-weather digging. This is but too commonly done, by turning the ground up rough, and leaving the whole in large clods. Such a process is highly objectionable, in a climate like Darjeeling, with a long, trying, dry season, and too subject to droughts in spring. It is, of course, quite different in Britain, where the soil exposed in a similar way is pulverised by the action of forest, and there is in general an excess. rather than otherwise, of moisture in winter. But this rough cultivation aggravates the defects of the Darjeeling climate, and intensifies the drought; while the clods, by the scorching action of the sun, get dried and baked like so many bricks especially in the southern and dry aspects. In all countries subject to droughts, especially in the tropics and sub-tropics, a thorough cultivation and pulverisation of the soil throughout, but especially at the surface, in autumn and the dry season, is by far the best for attracting and retaining moisture and obtaining healthy crop growth. Thorough cultivation admits of ample aeration of the soil. This is a subject which I have given much thought and attention to for 30 years. Shortly after I went to Darjeeling, I experimented with rough and thorough cultivation, on equal plots alongside, noting the result as to benefit derived from dew and retention of moisture, and can entertain no doubt as to the immense advantage of the latter system over the former. While making my farewell tours through the district in the spring of 1893, field after field, in different localities, came under my observation, lying exposed to the scorching sun in clods, in some instances almost half the size of a man's body, and I could not but sympathise with the proprietors. For the second and succeeding cultivation at the close of spring and the early part of the tea season, hand weeding is the most suitable and stimulating culture of all; and as an accompaniment the weeds or grass can readily be disposed of in layers or bands across the slopes, and (drainage having been attended to as referred t) check the "wash" in a wonderfully effectual way, even where there are no terraces. Hand-weeding may be carried on most advantageously, especially where extensions have been thoroughly prepared. In the rains, when hand-weeding has become impracticable and a turf has formed, the soil may be forked over less deeply and left rough, there being no longer fear of drought, and less from "wash." After an extra wet time, or on unsafe parts during the rains, nothing more should be attempted than close sickling, supplemented by hand-weeding, of spots around the collar of the roots of the plant

The great difficulty attending the perfect cultivation of a tea garden during the rains is, the crop must be gathered at the same time, and there is often pressure to get the leaf off at the most perfect stage. The time, nature, and amount of cultivation has, therefore, but too often to be regulated by the labour available for it. Forking ought to be avoided in excessively wet times, and done in favourable weather, but for the reason just stated, it is impossible always to choose the best time, unless the labour force be unusually strong—stronger perhaps than might prove profitable where coolies must be retained all the year round, as is the rule, and cannot be engaged for a pressure of work, and their services be dispensed with when it is completed. Extensions and building upon an old garden are also liable to retard garden operations, and add to a manager's difficulties and anxieties. Unfortunately, the real question is not to know what ought to be done in regard to cultivation, but too frequently what is practicable with the available labour. What has, in many instances, become a most vital matter on the hills, is how best to rectify the results of reckless or defective cultivation on old gardens during the past. This is sufficient to tax to the uttermost the skill and resource of the most ingenious, and in some parts, not to speak of impaired cropping capabilities, so grave has the evil become that the only effective remedy would be to carry back the soil from the valleys and hollows where it has in process of time been wasted. Terracing an old garden originally lined up and down hill, and often laid out in hedges without any such object in view, has its drawbacks. The plants that fall in the backs of the terraces get their roots bared too much and injured, and those in the edges are unduly buried.

Ploughing is impracticable anywhere on the Darjeeling hills, but in the plains districts might with advantage be restored to, and I daresay has been for the preparation of extensions, but whether steam ploughing has been resorted to or not, I cannot say. About 25 years ago I tested light ploughs by Ransome and of native pattern on a mature garden in the Terai, but the work was not fine or the result satisfactory. For the plough the distance between the rows would require to be wide, but in spite of this the lateral roots of the tea get damaged, and the cleaning close to the stems must be done by hand. The injury to the roots should to some extent be obviated by trenching all over as recommended on opening out, but ploughing on a planted garden is never likely to prove so advantageous as hand labour when procurable at moderate cost.

The manuring of the tea plant is for many reasons difficult, but fortunately the matter is not yet a pressing one generally, the tea crop being neither heavy nor exhaustive, and more nitrogen is undoubtedly returned in the rain than in more temperate climates. The average crop of green leaves taken from tho soil annually does not exceed 12 cwt. per acre (say half-a-pound per bush) which is very trifling compared with the weight of agricultural crops in this country exclusive of the portions thereof returned to the soil. Some attendant drawbacks to tea

manuring are want of an adequate supply, costliness of transit, liability to evaporation and waste, and tea being a deep-rooted plant the difficulty of applying the manure so as not to increase the growth of the weeds rather than leaf in the first instance. It has not been proved even how manure may affect quality, which is an important consideration and must depend upon the nature of the manure used. By all means let every available manure, solid and liquid, be preserved from waste through exposure—the danger of which is very great in a tropical climate—and be applied to the best possible advantage. But of all that is practicable in this line, I attach most importance to "green manuring" by means of turning into and burying in the soil in autumn the greatest possible amount of fresh and decaying growth. Let this work be pushed forward with the utmost vigour with all available labour. Nothing else in the way of manuring I know of can give so good a return. Top-dressing with leaf mould or other rich mould is also of immense benefit, and even when soil of only the poorest quality is procurable a thick dressing with that on thin dry parts has shown markedly good results. Manuring, and more so top-dressing, is comparatively unavailing—simply outlay and labour in vain—unless the application be a liberal one—three to five inches deep in the case of the latter according to quality of mould.

Transport by means of wheeled vehicles, in the ordinary sense of the term, is quite impracticable on any Darjeeling hill road, except the main military one, where cart traffic has been superseded by the wonderful Darjeeling-Himalayan Railway, and on one or two other pieces in or near the station. There are no lakes or navigable rivers as in Kashmir, and previous to the torrents being permanently bridged ferries even were not practicable except at one or two points in or near the Terai and they were always attended with some danger.

All carriages including that of ordinary building materials, fuel, provisions, is performed upon men's backs, and journeys are performed by pony, on foot, or, in the case of ladies, children, and invalids, in chairs or a form of hammock called a "Dandy," suspended on poles and carried by coolies. Heavy loads, such as boilers, tea, lead, and sometimes lighter packages, are conveyed from the nearest station to the gardens by trucks or trollies mounted on low broadrimmed wheels. The bringing down of a 20 or even 10 horse-power boiler of several tons weight is one of those little incidents that break the monotony of garden labour. Some skilful steering is needed in turning the acute corners of the zigzags, and in guiding the passage safely over many precipitous parts of those steep, narrow mountain paths. As many as 100 of the strongest men may be employed with a truck so freighted, chiefly strung upon ropes—some pulling before and others behind as occasion requires, the latter to prevent the truck getting beyond control by acquiring too much down hill velocity; others using crowbars, planks, or other appliances as need arises. In Assam and other plains districts of India and Ceylon, elephants are employed for the dragging of boilers, presenting scenes hardly if at all less picturesque.

In regard to buildings, time will not admit of my entering into detail. In the past the planter has been his own architect and clerk of works, planning, estimating for, and vigilantly superintending every operation from the sawing of the timber in the forest, the making and burning of the bricks, to the completion and full equipment of the edifice. The more modern and doubtless the most extensive buildings are in the plains districts of India and Ceylon, where extensions on an enlarged scale have been more recent; there in addition to the most modern mechanical appliances electric lighting has been introduced. In Darjeeling there has not been the same scope, the buildings had generally to be designed to suit the sites after costly excavation on the steep hill sides, and in the case of amalgamation of factories, for instance, ingenuity had to be exercised in the erection of a main central building to connect two others at different elevations, the ground floor of the one being near, but not on the identical level with the first floor of the other. The whole had to be designed for convenience, to deal with increased crops, and meet modern requirements. The managers' bungalows are generally charmingly situated, little being required, in the shape of landscape gardening, to make the surroundings altogether beautiful. These buildings, with their white-washed walls and shining roofs, studded over the hill-sides surrounded by the green tea gardens, present to the traveller at all points a striking and pleasant feature of the landscape. Many of the dwellings of the garden labourers are substantially built with brick walls, corrugated iron roofs at the higher, and thatch for coolness at the lower elevations, and verandahs in front. The floors are well raised, and space, convenience, comfort, and sanitation are provided up to and in most instances in advance of the tastes and wishes of the occupants. Few of them would tolerate fire-places, or the exit of the smoke by chimneys in the walls; but on account of warmth, or other reasons best known to themselves, prefer it finding its way from the centre of the floor through the ventilators in the roof, as in Scotland, within my own recollection, and I daresay in other civilised countries. Many darken or block up entirely the windows provided for them. However the modern coolie dwellings are a very great improvement upon the huts once universal, and in most cases all is being done for the coolies' comfort that is practicable or, at present wise. In the centre of the village there is generally a level plot reserved, though difficult to obtain, as a recreation-ground.

The view now presented includes a group of buildings comprising sub-manager's bungalow, factory with coolie lines in the background, to all of which pure water is conveyed from a stream on the opposite spur of the mountain two miles distant, by means of galvanised iron pipes passing through a deep ravine, where there is a pressure of 1,175 feet head of water at the lowest point. The company to which this small estate belongs has water laid on in pipes to all their coolie lines, where needful, factories and bungalows, having in operation for this purpose, as near as may be, seven miles of galvanised pipes of various bores, fed from filtering beds and fountain head tanks, and discharged into numerous large cisterns, from which and from "standpipes" convenient to all, including the coolies, are constantly supplied. Besides, this company has a supply of fire-hose fitted to discharge water with force at the highest point of the factories, and, in one case, at least out of three, with pressure sufficient to eject it over the roof of a three and a half storey house, the hose meanwhile being held in the hand on the ground. And, to convey some idea of the extent corrugated iron is in use on tea gardens, I may mention that the company referred to, though by no means the largest in the district, has in all imported 4½ acres to that material for roofing its own buildings.

The operations of tea manufacture are now performed by machinery in all factories of any importance. Steam is the commonest motor, but water-power (mainly by turbine) is also in use. In the case of the Tukvar Company, the turbine is situated in a ravine about two-thirds of a mile from and 1,500 feet below the level of the factory, the power being transmitted to the machinery there by means of wire rope, travelling upon pulleys supported on standards placed at suitable distances apart. The district owes the conception and accomplishment of this bold and arduous undertaking to the ingenious, indefatigable, and praiseworthy efforts of the late Mr. Thomas B. Curtis, of Tuckvar, a well-known and most able tea planter. On another hill garden electricity has for some time been employed, the turbine and generating apparatus being similarly placed beside the torrent far below and distant from the factory and machinery to be driven. For this laudable pioneer object lesson in regard to the motor, which I believe to be specially suited and destined to be the power of the future for Darjeeling, we are much indebted to the late, much-lamented Mr. Wm. Lloyd, who has besides rendered many public services to the district in the promotion of her mar-

vellous little railway, botanic garden, public park, Municipal affairs, volunteering, local banking, and the like, fully appreciated by few, and which never have been adequately acknowledged. Through his enterprise Darjeeling has been for 30 years conspicuous as the only tea district as such as far as I am aware, possessing a European bank.

To return to the field operations, a few remarks are called for concerning the pruning, which has to be attended to as early as the young plants betray a tendency to run up too much and assume the habit of a tree rather than retain the form of a bush, in the case of vigorous seedlings at as early an age as two years, and even younger where individual specimens show exceptional growth; that is, if the planter believes, as I do, in training the bushes when young, but opinion used to vary on this point as on much else connected with the industry. After the plants have attained three years of age they are all pruned according to their form and condition annually. The object of the operation is to get rid of the knotted unproductive wood, thin out slightly to admit air and light, leaving the young vigorous leaf-producing branches and shoots, to train the bushes to width—to give flushing surface, the leaf being gathered mainly from the top—and to keep them at a height convenient for the coolies to pluck the leaf from. Great caution is necessary in regard to heavy cutting in Darjeeling. The pruning is a work requiring a great deal of labour annually, and as many untrained coolies have to be employed, it demands close and constant supervision. The pruning season, as a rule, lasts from the end November till the beginning of March, but the more that is done from Christmas till early in February, the better.

Need I say, that tea is not made from the old, matured, or even hardening leaf, but only from the undeveloped bud and the young and most succulent leaves at the point of the growing shoots. In early times three, sometimes four, if not occasionally even more leaves were gathered, but more recently quality has become more and more the aim annually; and now it is the common practice to take only two leaves and the bud, but in some instances plucking is so select as only to embrace one leaf. The bud yields the finest tea of all, *i.e.*, the "golden tip" or "silver tip," the top leaf forming the next quality "orange pekoe," or when large "pekoe," and the second or lower leaf generally yielding pekoe, but "pekoe-souchong" when the leaf is large. Commonly the first shoots of the new growth of the season bearing, four, five, or six leaves go to make up what is termed the "first flush." The two top leaves of this, or in some instances only one leaf with the bud are plucked—that is cut off with the incipient tender stalk between the finger and thumb—for tea; the remaining leaves and stalk being too far developed for quality and necessary for the health of the bush, and the giving out of subsequent "flushes" are left. After the first flush, less fresh growth requires to be left, and after three or four months of discriminate, sparing cropping, the bushes having become sufficiently made up and fortified for the season, all the fresh growth that will make tea of prime quality may be gathered without risk of injury to the plants. The pluckers have to go round the gardens at intervals of from five to eight days, extended from nine to eleven days towards the close of the season, according to elevation. It is the pluckers' duty to avoid gathering too coarse leaves or unripe shoots, to miss no good, suitable leaf, and prevent the heating in the baskets of all that has been gathered. In plucking, much discrimination as well as dexterity is necessary, and though perfection may not always be attainable with many hundreds, including often a proportion of untrained pluckers, employed, the operations over the scattered fields on those steep rugged hill sides requires all the more unremitted attention and arduous supervision to obtain the most satisfactory results practicable. It is well when the leaf can be delivered at the factory twice during the day, but this is not always advantageous when the range of elevation is great. On plain gardens this is comparatively easy, light tramways being occasionally in use for the purpose. The cropping season generally lasts from the end of March till the middle of November. The crop varieties from eight to fifteen cwt. of green leaf per acre annually, which yields barely one-fourth its weight, say from 200 lb. to rarely so much in the present day as 400 lb. of prepared tea per acre.

The first operation at the factory is the weighing of the leaf. Here it is necessary finally to examine the quality and condition of the leaf brought in from the field. The pluckers are occasionally paid extra for what is gathered in excess of the allotted task, and if a shrewd inspection of the contents of the baskets were not made, in addition to leaves of inferior quality, a stone or other foreign substance might occasionally be concealed among the leaf to increase its weight. The leaf should be delivered green and fresh, but it is often wet, in fact this may be said to be its normal condition in the rains.

Thence the leaf is conveyed to the withering rooms or sheds which are fitted up with tiers of broad shelves of wire mesh, Hessian cloth, or bamboo netting, at heights and distance convenient for handling the leaf. The leaf should be spread out thinly, and the more extended the surface provided the better, up to say eight superficial feet per lb. of leaf. It is most desirable to have a free current of air to pass over and through the spread leaf, and to cause the air propellers known as "Blackman" fans, or others of similar description, are extensively used. Natural air is most desirable, but when the leaf is wet, the weather misty, and the atmosphere saturated with moisture, as is often the case, air slightly heated, and as far as practicable dried artificially, has to be applied instead, and it is under such conditions that the fans do much to facilitate and quicken, and prevent loss and injury to quality from unduly protracted operations, especially in the case of high-class hybrid leaf. The function of the fans should be to distribute the dry hot air and give ventilation over a wide area. The withering process is a very important one, it should not be done too quickly, and the great aim with it is to obtain fragrance, to avoid heating or discolouration of the leaf. By it the leaf should be brought into a flaccid state. This prevents its breaking up in rolling. Withered leaf to the feel resembles that of a fine kid glove. The process generally lasts from eight to ten hours in all. Wet leaf should be the more slowly withered, but ought not to occupy more than fourteen hours unless the weather be very unfavorable, and artificial heat be not restored to. The leaf leaves the withering stage of manufacture limp and flaccid, still green, but of slightly duller hue, and ought to be fragrant.

The next process is rolling, which is performed by machinery. There are several rolling machines by different patentees, each having their own advocates. The best known and most generally used are the Jackson machines, especially the "Rapid," which performs the work of about 70 men and does it to great perfection. By an ingenious arrangement of cranks, &c., an eccentric motion with elastic pressure (resembling that of the old hand rolling) is produced between a table and a box above which usually contains as much as 300 lb. of withered leaf at a time. This upper plate or rolling box is generally of metal lined with wood, but also of granite or marble for greater coolness. The lower rolling surface or table is usually of wood, but is sometimes granite or marble faced. This machine is beautiful though simple in movement, and as a roller as near perfection as can well be conceived. The leaf is usually rolled from 25 to 35 minutes according to quality of leaf and the views of the manager, then sifted on wire mesh sieves to separate the fine from the coarser which at the same time aerates it and breaks up the balls. The fine and coarser leaf are after this rolled again separately for from 10 to 15, and from 25 to 35 minutes according to quality, and under such pressure as desirable for each. Machines are also

designed and supplied specially for sifting, disentangling the balls, and aerating the rolled leaf. The withered leaf is fed into the hopper of the roller from the loft above by means of a canvas shoot, and the rolled leaf is discharged through a trap underneath into a trolly which conveys it to and from the sifter, and finally to the fermenting room. It must here be noted that the leaf on leaving the rolling machine has had its cellular tissues broken, has received a twist or "roll," and is a wet pulpy mass but still green.

Now follows the "oxidation," commonly termed "fermentation," without exception the most important process of manufacture. The rolled leaf having been sifted as referred to admits of the fine and coarser being oxidised separately, thus securing a greater uniformity of result. The fermenting room should be in the most shaded situation, and might in fact be partially—in some instances entirely—underground in the hills. The leaf is spread upon tables, or it may be on tiers, of ledged shelves resembling shallow empty bunks in a passenger steamer but at convenient height, in layers 3 to 4½ inches in thickness according to the temperature of the day and other conditions. Every means should be used to keep the leaf cool. It is kept covered with wet cloths, and surrounded by screens kept wet by constant syringing. The floors and surroundings are also syringed with water. I am unable to say how far refrigerating apparatus might be adopted in the fermenting rooms with good results. This has been thought of by a Darjeeling manager, long a fellow-worker with me. I am, however, enabled to testify as to the best quality having been obtained at the coldest season, and when the oxidatien occupied an unusually long time. The great secret is to be able to check the "oxidation," or incipient fermentation at exactly the right stage, as quality will be unfavourably affected by under doing it or over doing it. The time occupied varies generally from 3½ to 5 hours, but 5 or even 6 hours towards the close of the season and at high elevations is nothing unusual. A great test of the result is when a bright salmon colour resembling that of a new penny is obtained in the mass. It is important here to observe that the leaf entered upon the "oxidation" process, green and wet, but leaves it for the next, which is drying, a bright salmon-colour and slightly less moist.

In former times the leaf at this stage underwent a process called "panning," which for many years has been entirely dispensed with. In this the leaf was turned over and tossed about in highly-heated iron pans by the operators' hands, aided by a forked stick. This was the most trying process of all for the "teamen," and unless it had some advantages in regard to the keeping or other properties of the tea—and it would seem impossible for any one positively to assert that it had not—it is well it has been abandoned, as it was a dirty, troublesome, risky process, calling for the consumption of no little fuel. After the panning (which occupied the position of the sifting referred to) the leaf received a second and final rolling.

There are several tea-drying machines. The best known are those patented by Jackson and by Davidson. But each machine finds its own ardent advocates among producers and their mangers. Jackson's "paragons," his latest inventions in this line, are like some of his others automatic in their action, and, as their name indicates, work to very considerable perfection. By these machines the leaf is passed through a chamber filled—by means of a fan—with a current of air heated to a temperature of 240 deg. to 250 deg. (reduced to, say 200 deg, for finishing), on a travelling endless web of perforated zinc sheets or "flappers," which convey the leaf backwards and forwards through the drying chamber, turning it over at either end, in all, seven times through its entire journey. The wet leaf is fed in at the top, and there is a continuous discharge of the dried tea at one of the lower ends of the machine. Davidson's dryers are worked by means of wire mesh tray drawers, containing the leaf, which are pulled out to have the leaf turned over, and are pushed back again into the heated chamber, and this process repeated by hand, to meet requirements and the views of the manufacture, his "down-draft sirocco" being worked with the "up-draft sirocco" with a fan. The mode of desiccation just superseded by machines, and which has all but disappeared, was that over charcoal fires in brick-work furnaces, with wire mesh trays worked by hand. The original method of drying, as practised by the Chinese, and for years in India, was still more primitive. It was by bamboo mesh trays, placed on the top of light wicker-work cylinders of the same material, encircling small charcoal fires placed in holes in the floor. These cylinders stood about three feet high, and were narrower in the middle than at top or bottom, resembling in shape some wooden egg-cups of the olden time. The leaf goes into the dryers a salmon colour, but in the process of drying it changes colour, and is discharged from the machine (or other process) dry, crisp, and black, and its twist has become more perfect and wiry; in fact, it is now practically the tea of commerce,; "unassorted," only requiring to be sifted into "classes."

The classification of the tea is performed by machines, by means of wire mesh of different gauges, receiving the unassorted tea above, and discharging it as "broken pekoe," "orange pekoe," and "pekoe-souchong" from shoots into their respective compartments below, in which boxes or other receptacles may be placed to receive the different classes. The long reciprocating sieves, though cumbersome, have no other fault I know of, and are simplicity itself, consisting merely of a succession of webs of the required mesh placed end to end, discharging the various classes into receptacles placed underneath, the large leaf being dropped over the end.

From some of the classes thus obtained, especially the lower grades, a few coarse leaves, stalks, or stray foreign substances may have to be picked out —the operation being impracticable by machinery. But a few bright, tidy Nepali girls soon give those light finishing touches, which hardly amount to handling in any degree. For this the tea is placed upon bamboo trays by an expert jerk, of which the contents are turned over from time to time for examination, and the required sorting out very deftly performed with delicate pliars, simply formed of two slim springy splints of bamboo ingeniously joined together.

The final process is packing. To do this daily as the tea is made has but little to recommend it, but if it were otherwise, it is not always practicable. The insuperable objection to this arrangement however is, that one day's manufacture, even when the same in appearance, differs unaccountably in quality and character from that of another, and the contents of one chest, must, as a rule, be different from that of another in the same break, entailing bulking at home with its consequent damage to the tea, and extra expense. All tea, I hold, ought to be bulked at the factories, where alone the operations can be performed to perfection. For this purpose each class, on being assorted as just referred to, should be put away in a separate "bin" daily, and retained there till thirty, forty, sixty, or more chestfuls, according to the size of the factory, accumulate. These bins, of course, must be in a dry situation, zinc lined, with closely-fitting hatches above and doors below, and perfectly air-tight all over. The bins should also be all carefully cleaned and dried for the reception of the tea to be poured in through the hatches. It may be accepted as an axiom that well-cured tea, perfectly stored, will improve by keeping, and the larger the quantity the greater the improvement. Poured in and kept as referred to, the tea will not only get well mixed, but one day's make will get blended with the others, without which no bulking can be complete. For factory bulking uniformity of tares is imperative. To secure this the chests must be made from evenly sawn, clean, and perfectly seasoned boards; and to more perfectly equalise the tares,

the chests should all be carefully classified by weight, those of (say) 23 lb. being laid aside for the "broken pekoe," those of $22\frac{1}{2}$ lb. for "orange pekoe," those of 22 lb. for "pekoe," $21\frac{1}{2}$ for "pekoe souchong," and so on. Providing the sawing has been done with reasonable uniformity, by this means and the interchange of lids, the tares will be found practically even. But, at any rate, this difficulty can surely be surmounted by the use of machine made boxes, patent "veneer" or metal chests, or some similar device. When sufficient tea has been collected in the bins to complete "breaks" of the desired size, it is drawn from the lower doors, of which it may be found advantageous to have more than one or even two to a bin. This alone goes far to mix the whole. The tea is then slowly dried at a comparatively low temperature to ward off the slightest trace of moisture, thoroughly mixed in a large heap in a dry apartment, on a canvas sheet on a clean and perfect floor, to complete the bulking. It is then packed hot in the lead-lined cases. The packing can now be done by the "Davidson-McGuire patent packer," which ingeniously imparts a rapid, short vibratory motion to the chest being filled, obviating trampling, unequal pressure, breakage, and discoloration. This machine is coming into use on the gardens, and the sooner it is also universally adopted in the London warehouses the better, not only for the above reasons, but to compass the only missing link in the entire circle of machine manufacture. This machine claims to pack so as "to preserve the even grade of the perfectly bulked tea," through-out its passage to market, which would be an immense boon to the industry. It may be an aid, however; when packing by machine—as it certainly was without—to place a thin scale inside the box (better one at either end), graduated to, say, eight, or some other convenient number of equal, parts of its depth to be filled, so that exactly the proportion of the weight to be packed shall occupy the corresponding space, neither more nor less, and thus secure an uniform compression of the tea throughout. This will prevent the tea having to be crunched up or pressed too much to get the required contents all into the box at the finish, or, on the other hand, having it too loose, in the case of too much pressure having been applied and the tea caused to occupy too little space at the early stage of filling. As soon as the chest has received its exact quantity, the top of the led lining in closely soldered down, hermetically sealing the contents. Finally the chests are marked with stencil plates, and secured by hooping or otherwise for the perils of a trying journey by land, which, as regards strain upon the boxes, do not even end at the port of export.

Darjeeling tea is all carried by the hardy hill-men up the steep mountain roads to the nearest railway station on the way to market. It is no unusual day's work for a coolie to carry a tea chest weighing 110 to 130 lb. a distance of five or six miles, making at the same time an ascent of from 2,500 to 3,500 feet, in sheer vertical elevation. There can be no deception about a task like that, and we cannot but have an admiration for the powers of endurance of those who perform such a feat. Of course, these people are trained to load carrying and mountain climbing from their very infancy, and hence the peculiar set of muscles required for it are fully developed, if not actually called into existence at the cost of others, so much so, that walking on the level, after a few miles, becomes positively painful to them. In the prosecution of their own trade, or on domestic affairs, they frequently undertake, long, arduous journeys over ridges and along and across hot valleys, varying many thousands of feet in elevation, occupying many days on end, carrying heavy loads of from 150 lb. to 200 lb., and over and in addition their own food and bedding, most cheerfully lighting a fire, cooking and eating their scanty meal, and going to sleep by the wayside. There is a story still current of a Bhooteah in old times having carried a grand piano up the hill to Darjeeling, a distance of 50 miles forward, and involving a rise of over 7,000 feet in elevation by the old road. These hill tribes are a hardy people capable of performing marvellous journeys without partaking of food, or on the most meagre fare. They have no surplus flesh about them. In this they have at least the advantage of the majority of Europeans.

Green tea has never been manufactured in Darjeeling beyond an experiment. The process is less varied than that just described for black, but here I cannot speak from experience. Mr. Fortune, who travelled in China from 1848 to 1851, was the first to place beyond doubt that both kinds of tea are made from the same shrub. The Indian planters were not, I believe, successful in producing tea of so deep or uniform a green as the Chinese, because they did not resort to artificial colouring with Prussian blue, gypsum, &c.

Brick tea claims to be mentioned. It is largely used in Tibet and the adjacent countries, on the direct route to which Darjeeling is situated, but the trade has so far been exclusively with China. The possibilities of trade in this direction have never altogether been lost sight of. A few bricks have occasionally been prepared by way of experiment. At present all that can possibly be done is to ascertain the requirements of the market, as by our recent treaty with China British grown tea cannot be imported into Tibet before 1st May, 1899, and then "at a rate of duty not exceeding that at which Chinese tea is imported into England."

Much might be said on the all important subject of quality. In Darjeeling that depends mainly (1) upon soil, on (2) the vigour of the bushes, (3) variety of plant, (4) elevation, and last though perhaps not least (5) the season (and mysteriously so often), the weather. Apart from these natural advantages or disadvantages as the case may be, much is due to skill and unremitted vigilance and care throughout all the operations; and an ample supply of machinery factory accomodation and equipment, to enable any rush of leaf to be coped with advantageously. As explained cultivation must tell in the long run, but for immediate results fine plucking is the main point, to secure which an ample supply of labour is indispensable. Indeed, I have always believed that half the battle is outside the factory entirely. It is quite easy I admit to make bad tea out of good leaf, but it is on the other hand beyond the power of the most skilled to obtain quality from coarse badly-conditioned leaf. The spring teas are now inferior to what they could be, because the plucking is then for the benefit of the bushes not for quality. Better teas could very easily be made at the outset, as had often been done, at the cost of the bushes, and though not of the quantity in the same year certainly at the expense of the quality of the after flushes. Contrary to general belief, I am fully convinced that the maximum crop the bushes can safely yield, is quite compatible with the best quality. This is merely a question of labour.

From the illustrations already shown, it must be evident that one of the great advantages of British grown tea is the cleanliness of its preparation compared with the unsavoury methods of hand and feet manipulation still common in China, and not pleasant to think of considering the climate and the habits of Oriental labourers. The contrasts, as described and illustrated by Mr. Fortune, furnish matter for a separate paper.

The important subject of the chemistry of tea I am not able to deal with, even though time permitted. In spite of the able and valuable efforts of Mr. Kelway Bamber and others, I fear practice has as yet benefited little, and this remains practically an unexplored field of investigation.

Some of the earliest Darjeeling gardens were planted in part with a good variety of hybrid, which still influences the quality of their produce. Afterwards, for a time, there seemed a reaction in favour of the China plant, but for the last 15 years extensions generally have been with hybrid. It would not be well to plant pure Assam or a high class hybrid solely, as that would fail to yield the true Darjeeling flavour. The Assam indigenous has also a tendency to become deciduous on the hills, if not upon the choicest sites. A blend from China and hybrid plants is, I believe, best of all, and I

may say that all Darjeeling gardens, famous for quality, have this. I have experimented with small fields of Assam and Munipuri indigenous, and have always recommended extensions with hybrid of variety to suit the different elevations and other conditions, and would do so still, because in addition to other advantages, leaf is gathered from such more economically. There are, however, many slightly different shades of variety of the China plant. During the struggling days of tea, 30 years ago, it used to strike me that much alone would have been gained by planting only a careful selection of the best strains, capable of still further improvement by cultivation; and I am fully convinced that—especially on high elevations—the best varieties of the now too-much-despised China plant, or a hybrid nearly allied to it, will yield tea of the choicest quality. In Darjeeling plants grown from high-class hybrid, or pure indigenous seed, in course of years revert towards—or, more correctly, assimilate—the China type; and further plants which, when young, appeared perfectly uniform in variety, size, and shade of leaf, as they get older become mixed and unequal in those respects. This, as well as the fact that tea has never been found indigenous anywhere in China, would go to show that India is the original home of the tea plant; that there is but one variety, the Indian; and that the comparatively dwarfed growth and diminished leaves of the China variety are due to the unfavourable conditions of soil, climate, and treatment for centuries.

It is unnecessary to state that a tea garden is not repeated and re-planted annually; on the contrary, a tea estate is an investment from which a proprietor, after the expenditure of much capital, has to wait long and patiently for any return from its working. Even under a combination of favourable conditions one would be sanguine to expect tea to be self-supporting within six years on the hills, or from four on the Terai. But there are many contingencies, such as scarcity of labour, sickness, unfavourable weather, pests, and last, though not least, depressed markets, to upset what would seem the most moderate and reasonable expectations. Any one opening out a new garden gradually—which, in most circumstances, is the only way to do so efficiently—might certainly be considered over sanguine if he calculated upon a clear profit on its working within seven years on the hills or five in the plains there is, however, his set-off that with judicious and skilful treatment, the same bushes, with partial renewals, where vacancies arise, should go on yielding full crops for a period to which it would be difficult to assign any limit—possibly not less than 100 years on good soil on the higher elevations on the Darjeeling hills. With injudicious cultivation and treatment, and upon poor, dry soil, it is, of course, different. It is, therefore, difficult indeed for proprietors and auditors to determine what to write off annually for the ageing and depreciation of the bushes. But investors in well-equipped concerns have, in these days of general agricultural depression, landed security of really the very safest class, from the fact of the tea harvest being spread over eight months annually. This secures the crop against the vicissitudes of seasons, in the form of a month or even two of adverse weather at any stage, which is certainly not the case in this country where the whole crop comes to maturity or ripens in a few days or even weeks.

On the hills labour may be said to be solely Nepalese, and in the Terai, Nepalese and Nagpuris. It is "free," that it is, not subject to the regulation of any special legislative enactment. The Nepalis immigrate freely, and very many are born and bred on the tea gardens. They belong to the same race as the Goorkha soldier, the flower of our native Indian army, are a capable, cheerful people, of whom much can be made. Those bred on high elevations are stronger and more capable than those reared at low, hot elevations, but the former generally prefer to remain upon similar zones to those they have been accustomed to. No class can perform so much work at low as at high elevations. The rates of wages in Darjeeling, as in all the large tea districts, is high compared with that elsewhere in India, except in connection with European enterprises. But in addition to money wages, houses, fuel, water, medical attendance and medicine, and a covering for protection from the rain when at work or on a journey are provided at the expense of the garden, and most of the coolies keep goats, fowls, pigs, and the head men even have one or more cows, and occasionally a pony. In some instances land is also allowed for cultivation, which has always attractions, but this, as a rule, benefits but little the labourer for whom it is intended, and is carried out at a cost to the concern in land occupied and impoverished, and destruction of forest that would seem rarely realised or even thought of. Though the wages may not seem high, generally 5 rupees 8 annas to 6 rupees 8 annas a month for men, 4 rupees 8 annas to 5 rupees for women and strong boys, and 3 rupees for children, for the reasons just mentioned—necessaries being cheap, and several members of the same household working; those coolies who work full time or nearly—which very many will not do—contrive to save a considerable proportion of their earnings. At market and on holidays the garden labourers dress brightly, and their savings are conspicuous in the form of strings of rupees or other coins around their necks, and the costly gold and silver ornaments worn. Native assistants, contractors, overseers, artisans, engine-drivers, machine attendants, teamen, and petty gangers earn very high wages for the East, and the coolie class have often the opportunity of adding to their monthly wages by extra tasks performed—contracts, works undertaken, and the like. Within the last 25 years much has been done for the coolies' comfort and welfare, and as their tastes expand more will be done. From a somewhat intimate knowledge of both classes I, without hesitation, assert that, considering the nature of the work and climate, those coolies in their own sphere are at least as comfortable as the agricultural labourer at home was thirty years ago, and certainly more contented than he is now. The natives have many excellent opportunities of improving their position on tea gardens they otherwise could not possibly have had. As an instance, one Nepali from infancy known to me, whose father was a garden coolie on the ordinary pay, and who himself worked as a boy at 3 rupees for a time, and is self-educated in English, was gradually, but most deservedly, promoted, till for years he has been in receipt of 110 rupees a month, and in addition bonuses on the profits as a reward for valuable services rendered, amounting to from one-third to three-fifths of his salary annually. Numberless other instances could be given of the betterment of natives on tea gardens, to which there is no parallel in native farming or other pursuits. No one could be 30 years in Darjeeling without becoming strongly attached to the place, but I also parted from the natives with no little regret. And this much I feel in justice bound to say, that whatever little I may have been enabled to achieve in the way of modern tea extensions, under some considerable natural disadvantages, was in no small measure due to the loyal aid I have had from natives, and that among the more intelligent of those who worked with me for long periods of years I have found some absolutely truthful and honest, and not only competent but as conscientious and diligent workers as could be wished.

In regard to tea nothing is of greater importance than labour In this respect Darjeeling is comparatively fortunately, though many gardens—especially those at low elevations or without special attractions to offer—are as a rule short of requirements not only for high but fair cultivation during the manufacturing season. One serious drawback, however, is the small and steadily diminishing proportion of men coolies upon the gardens. In the case of one concern employing not less than 1,400 coolies daily the proportion of men has fallen within the last twenty years (not to go further back) from 42·6 per cent, to 17·5 per cent last year. This I have ascertained from the records,

but before leaving Darjeeling, in 1893, I was assured by several managers, on whose authority I could fully rely, that the men upon their gardens did not average more than 5 to 10 per cent of the labour force. This may be due in some slight measure—but only to an inappreciable extent—to the growing wants of the station and the spread of education. The evil, now most serious, may be to put down as entirely chargeable to the Government recruiting at Darjeeling for military police, and in the past for various military expeditions, public works, and other departments, and for the native army. I do not charge the Government officials with willingly doing this great injustice, because on the contrary, I feel perfectly assured they would be delighted to benefit the industry and district, as, I am glad to acknowledge, we have often had proof. But yet the recruiting is not put an end to, notwithstanding the repeated appeals of local representatives of the industry. This is doubtless due to the change of governors, and the administrative head of the district only holding his appointment for two years. It simply arises in this way—the men are wanted at short notice and must be got, but all the same the injustice is very great. The gardens have collected their coolies at considerable outlay, and are relying upon them for efficient working. Of those who leave on military service, many never return, and most who do are broken in health, so the injury inflicted is permanent, as statistics prove. The system is most unjust: it inflicts heavy loss on proprietors, and untold annoyance to managers, and has the worst possible effect on the coolie morally. The remedy is very simple. Let Government lay its plans sufficiently ahead; decline to entertain garden labour under any pretence; make advances and recruit from Nepal, as the planters do, or from the plains of India or their own native colonies at Kalimpong and elsewhere in the district, which, as stated, is much more than twice the area of the tea grants, and which must be pronounced a great failure in every way if unable to meet such a demand. I hear that Government have recently proposed to restrict recruiting in the Darjeeling district. But this is not sufficient now that the evil has become so acute, the gardens having been so depleted of men. The recruiting at markets or other centres frequented by, and the entertaining of garden coolies obtained directly or indirectly should I submit, be entirely discountenanced and put an end to by Government. I most respectfully but earnestly appeal to the executive of the Society of Arts to use their influence with those in power to aid the Darjeeling tea industry in this matter.

Another important subject, that can only be briefly mentioned, is forests. Their conservance, in the majority of cases, has been too little attended to, and proprietors must soon discover, if they have not already done so, that they have, to their own irreparable disadvantage, been playing into the hands of the Government Forest Department, the fuel-economising boiler inventor, and the electric engineer.

Neither can blights be dealt with. These are sure in time to follow large tracts of cultivation of whatever kind, and those concerned must make the best of the situation. "Red spider" commenced its ravages in the district in 1876. It was first most severe in what seemed a special zone of its own—the dry, hot valley of the little Rungheet river; now it is pretty general in the Terai and all over the hills. Nowhere has the pest been entirely eradicated, but a very effectual remedy is sulphur, which on many soils act as a manure. The "mosquito blight" though noticeable 25 years ago, was nowhere severe till about eleven years ago. It has long done serious damage in the Terai and Mahanuddy Valley, and seems to have increased in severity in other parts of the hills during the last few years. Owing to this pest being winged and migratory, and its attacks worst when quality should be at its best, it is less amenable to any application than red spider; but so far as my experience goes, injures the health of the bush less. Numerous other pests are known, but none of them are, as a rule, really very hurtful, "Green fly" does not injure the constitution of the plants, improves quality, and plants, improves quality, and proves helpful rather than otherwise. And there is this consolation, that pests on the whole, if they do not become more serious than they have yet been, may not be looked upon as altogether an unmitigated evil in these days of threatened over-production, from extensions recently and now being made, as well as in view of the cropping potentialities of the present bearing areas.

The Terai was opened out with inordinately sanguine expectations of proving much more remunerative than the hills; and at present I cannot but believe it has become unduly depreciated in public estimation. This is the rule with tea. The greatest drawback is undoubtedly its unhealthiness. In this respect there has been less improvement than might have been expected from the clearances. As has been remarked, it has also suffered severely from blights. The soil is generally good, though not equal to the best of the Dooars, with which, however, it compares much less favourably in regard to spring rainfall. The Terai has suffered from its labour having been attracted to the Dooars, and when attacked by blights, and requiring all the more liberal cultivation, I cannot but think that for some years before 1893 (when I last visited it) the short-sighted policy has been but too often that of restriction and starvation. If this continues, the gardens cannot fail to fall more and more into the hands of native managers and owners. Under an improved water supply and sanitation this district should become more salubrious, and, with liberal and suitable cultivation, and efficient, but economical management, the Terai should yet compete, not unsuccessfully, with most other districts.

Interesting though it be, the subject of a tea planter's life, duties, qualifications—which are multifarious—and prospects cannot be entered upon here. One observation I may be permitted to make. On tea gardens all Europeans, in relation to age and social standing, have the welfare, happiness, and comfort of numerous fellow-creatures in their hands, to an extent unparalled in this country. Hence their responsibility and influence are proportionately great. Those, therefore, who are unswervingly just in their dealings with, and have a kindly fellow-feeling for, the natives—a knowledge, not only of their language, but of the little idiocyncracies of mind and thought, and are most considerate in regard to their customs and habits—will best discharge their duty to a subject-race, and cannot fail to prove most successful planters. Very much depends, of course, upon the European staff. Their lives, as a rule, are retired and solitary, often wanting in plain comforts. Their duties are exhaustive, and frequently depressing, and, when faithfully discharged, they should meet with the support, encouragement and sympathy of the proprietors and directors.

What has, more than anything, enabled the industry to cope with the greatly diminished sterling price of tea during the last twenty years has been the introduction of labour-saving machinery and the fall in exchange.

The most encouraging out-look for the future of the British-grown tea industry is that 38,428,157 lb. were taken by markets outside the United Kingdom during 1895, being an increase of 9,000,000 over 1894, as against 19,300,000 in 1893, and nearly three times as much as that of 1890, which was 13,400,000 lb. There is, therefore, every reason to hope that under energetic and well-directed efforts to develop them the foreign markets will absorb—or go very far to absorb—the greatly increased crops to be expected from the large extensions recently made, and still being made. The expected shortfall of imports from China for 1896 is also encouraging.

But the fact must not be overlooked, that not for nearly twenty years have we found the consumption of Chinese tea increase and that of Indian fall off in the same year, as has been the case during 1895. Though there are some, directly in touch with the consumer, who assert that there is a reaction setting in favour of Chinese tea, I believe the slight relapse is quite satisfactorily explained otherwise, and may be ascribed to medium Indian teas having been comparatively dear for a few months early in the

year. Still the public taste in tea cannot, more than in anything else, be entirely exempt from the law of the pendulum. We are apt enough to console ourselves that the home market has been won. Be it so, we have got to hold it. It therefore behoves all concerned to see well to the weak points in our methods, and leave nothing undue that is needful to insure the supremacy of British grown in the public estimation at home and abroad.

One matter I feel in duty called upon to allude to in this connection. I refer to the handling of our tea in the London warehouses. This is perhaps not the place for free criticism or full discussion. I shall not, therefore, enlarge upon the cruel manner in which the lids of the chests are removed, and the lead linings opened; or the exposure of the tea for a greater time then it ought to be in bulking; the condition in which the linings are replaced, especially those which have accidently been in contact with a nail; the refilling under the heel of the dock labourer; and, worst of all, the boxes being left unsoldered till they reach the consumer in the country, or it may be America. I have every sympathy with the warehouses in regard to the pressure upon them through the work being crowded into so short a time. But no one can say the teas are treated as they ought to be. No natural atmosphere is absolutely dry, and that of London is often very damp, and tea is extremely absorbent of moisture of any taint in the air. The papers carefully placed under the diminished and tattered lead linings are necessary to prevent the contents from pouring out in transit, but is altogether inadequate for the exclusion of moisture from a substance so attractive of moisture and so volatile of its aroma as tea. The tea cannot fail greatly to deteriorate under the treatment the Indian produce generally undergoes. The system also of dealing with the fractions of pounds in weighing the gross and tares, tolling in both directions against the producer, is manifestly unfair. The difficulty of interfering with long-established trade customs must be admitted, and I am saying nothing here against the 1 lb. draft, which is a known quantity, and surely ought alone to be a liberal trade allowance. Though the loss in taring may be averaged and allowed for over large operations by the buyer, it must partake of the nature of a lottery, and is most unsatisfactory and objectionable to the producer, especially the smaller of them, who feel it keenly to be an injustice. Though the Customs by general order provide for tea being weighed net, which would mitigate the hardship, and as far as I can see, also overcome the difficulty of uneven tares, strange to say the concessions remains a dead letter. The remedy for the evils complained of seem simple:—(1) Bulk at the factories, with tares equalised for each break; (2) repack dry at once, with the packing machine, the small proportion of chests it would then be compulsory to open on this side, repairing the linings with lead, resoldering or otherwise hermetically sealing the contents as may obviate the use of fires it need be; and (3) weighg ross and net (not the tares) under the general order referred to, amended if necessary to meet all reasonable requirements. It is satisfactory that at least one warehouse (St. Olave's) have fitted up packing machines to supersede the trampling process, and this laudable arrangement merits recognition and encouragement by importers.

In this great metropolis it might be expected that the methods of dealing with such an important article of food would be intelligent, cleanly, and even scientific. The prevailing practice is but too much the reverse of all this. The usages, to put it mildly, are antiquated and unworthy of a great industry. It is indeed amazing that they been tolerated so long. They are productive of most serious loss to the producer and consumer as well as to the national exchequer; must be an annoyance to the brokers and dealers, and disadvantageous to even the warehouses in the long run. More than this, they are grievously fettering and handicapping the British tea industry. The time is certainly ripe for combined action to secure the urgently needed reforms, which if delayed cannot fail, sooner or latter, to injure this great distributing tea centre.

APPENDIX I.

AREA OF BRITISH-GROWN TEA, ACCORDING TO GOVERNMENT RETURNS FOR 1894.

India—	Acres.	
Assam	154,281	
Cachar	59,586	
Sylhet	54,926	
Darjeeling..	*70,038	
Julpaiguri (Dooars)	*43,133	
Chittagong	4,501	
Hazaribagh and Lohardaga.. ..	3,394	
Kumaon	3,140	
Dehra Dun	4,512	
Kangra Valley	8,826	
Madras (Neilgherries, &c.) ..	6,102	
Travancore and Cochin ..	9,079	
Burma	880	
Andaman Islands	650	
		423,006
Ceylon (for 1895)		301,843
Natal..		2,297
Fiji		110
Straits Settlements (area not known at Colonial-office " believed to be inconsiderable") retained under cultivation, say..		200
Total..		730,756

APPENDIX II.

TABLE COMPILED BY MR. A. G. STANTON, SHOWING GRADUAL DISPLACEMENT OF CHINA TEA SINCE 1866. WITH PER-CENTAGE OF EACH KIND USED, AND QUALITY OF ALL TEA PER HEAD OF POPULATION.

Year.	China, &c.	Per cent.	Indian.	Per cent.	Ceylon.	Per cent.	Total.	Quantity per head of population in lb.
'66	97,681,000	96	4,584,000	4	—	—	102,265,000	3·42
'67	104,682,000	94	6,360,000	6	—	—	110,988,000	3·68
'68	99,339,000	93	7,746,000	7	—	—	106,815,000	3·52
'69	101,080,000	90	10,716,000	10	—	—	111,796,000	3·63
'70	104,051,000	89	13,500,000	11	—	—	117,551,000	3·81
'71	109,445,000	89	13,956,000	11	—	—	123,401,000	3·92
'72	111,005,000	87	16,656,000	13	—	—	127,661,000	4·01
'73	111,665,000	85	20,216,000	15	—	—	131,881,000	4·11
'74	118,751,000	87	18,528,000	13	—	—	137,279,000	4·22
'75	122,107,000	84	23,220,000	16	—	—	145,327,000	4·43
'76	123,364,000	83	25,740,000	17	—	—	149,104,000	4·49
'77	123,300,000	82	27,814,000	18	—	—	151,114,000	4·50
'78	120,652,000	77	36,744,000	23	—	—	157,396,000	4·64
'79	126,340,000	78	34,092,000	22	—	—	160,432,000	4·68
'80	114,485,000	72	43,836,000	28	—	—	158,321,000	4·57
'81	111,715,000	70	48,836,000	30	—	—	160,051,000	4·58
'82	114,462,000	69	50,496,000	31	—	—	164,958,000	4·69
'83	111,780,000	66	58,000,000	33	1,000,000	1	170,780,000	4·82
'84	110,843,000	63	62,217,000	36	2,000.000	1	175,060,000	4·90
85	113,514,000	62	65,678,000	37	3,217,000	1	182,409,000	5·06
'86	104,226,000	59	68,420,000	38	6,245,000	3	178,891,000	4·92
'87	90,508,000	49	83,112,000	45	9,941,000	6	183,561,000	5·02
'88	80,653,000	43	86,210,000	47	18,553,000	10	185,416,000	5·03
'89	61,100,000	33	96,000,000	52	28,500,000	15	185,600,000	4·99
'90	57,530,337	30	101,961,686	52	34,516,469	18	194,008,492	5·17
'91	52,287,304	26	98,491,931	49	51.227,602	25	202,456,837	5·39
'92	34,483,408	17	109,528,169	53	63,102,127	30	207,113,704	5·43
'93	35,735.722	17	108,143,602	52	64,218,061	31	208,097,385	5·41
'94	25,805,313	12	116,965,653	55	71,570,078	33	214,341,041	5·53
'95	31,433,014	14	116,343,316	53	71,023,810	33	221,800,140	5·57

* These figures show increases from 1893 and previous years that seem much too great for Darjeeling and too little for Julpaiguri.

APPENDIX III.

RAINFALL ON THE LEBONG TEA COMPANY'S ESTATES, DARJEELING, FOR 21 YEARS, (1872 TO 1892.)

Years.	Badamtam Factory. Elevation, 3,330 feet. Days with rain.	Inches.	Barnesbeg Factory. Elevation, 3,200 feet. Days with rain.	Inches.	Manufick, Tukvar. Elevation, 5,200 feet. Days with rain.	Inches.	Vah, Tukvar. Elevation, 3,700 feet. Days with rain.	Inches.
1872	129	85·46	..	..	159	90·62	125	91·81
1873	121	56·53	..	..	125	76·16	126	71·29
1874	139	86·62	..	..	167	122·26	160	97·05
1875	117	66·02	..	..	119	96·02	141	70·05
1876	129	63·37	..	..	159	90·38	140	75·24
1877	151	59·00	..	..	171	94·92	146	76·27
1878	143	67·56	..	..	173	101·20	150	79·75
1879	148	92·44	141	95·48	145	132·76	152	101·51
1880	165	85·04	148	81·10	172	128·68	182	91·93
1881	146	76·45	154	75·21	163	110·37	168	84·73
1882	155	83·84	144	87·98	152	117·35	166	101·60
1883	125	71·31	114	78·89	133	106·22	141	99·31
1884	136	55·12	133	57·33	135	84·75	152	70·70
1885	155	75·21	138	81·72	152	110·60	156	99·74
1886	136	65·12	127	75·04	151	108·45	143	83·67
1887	151	81·39	140	81·15	166	109·29	158	93·38
1888	145	55·31	119	61 59	156	82·93	156	69·19
1889	147	84·64	138	91·18	158	110·91	151	102·62
1890	139	111·91	144	109·92	156	138·29	151	124·67
1891	123	53·06	133	61·96	141	85·22	127	71·72
1892	129	83·83	154	86·05	154	107·67	151	93·77

APPENDIX IV

RAINFALL AT TUKVAR, LEBONG TEA COMPANY, DARJEELING, ELEVATION 4,500 FEET, FOR THE FIVE WETTEST AND FIVE DRIEST DRY SEASONS DURING THE 27 YEARS FROM 1866 TO 1892.

	WETTEST.										DRIEST.									
	1870-71.		1874-75.		1876-77.		1866-67.		1882-83.		1875-70.		1873-74.		1883-84.		1878-79.		1877-78.	
Months.	Number of days on which rain fell.	Inches.	Days.	Inches.	Days.	Inches.	Days.	Inches.	Days.	Inches.	Days.	Inches.	Days.	Inches.	Days.	Inches.	Days.	Inches.	Days.	Inches.
October	15	11·13	13	13·08	11	5·19	7	10·44	13	11.29	5	0·40	—	—	2	0·22	6	3·11	1	0·78
November	5	2·49	—	—	2	0·51	1	0·04	3	0·38	—	—	—	—	1	0·02	1	0·03	—	—
December	1	0·07	1	0·30	2	0·74	1	0·21	1	0·03	1	0·22	—	—	1	0·08	—	—	2	0·67
January	1	0·03	5	1·16	6	3·24	1	0·20	3	2·99	5	0·53	2	0·32	3	0·09	1	0·01	2	0·33
February	10	1·24	2	0·27	3	0·74	3	1·42	2	0·38	—	—	5	0·75	8	1·32	2	0·23	6	0·59
March	9	1·12	5	0·71	8	1·71	15	1·61	1	0·15	3	0·38	7	0·63	4	0·49	1	0·13	8	1·71
April	14	2·85	12	2·13	8	5·49	17	8·56	7	1·60	6	2·02	10	1·76	12	2·22	4	1·06	12	2·34
Total	55	19·63	38	17·65	53	17·59	15	17·48	30	16·82	20	3·45	24	3·46	31	4·44	15	4·57	34	6·42

FRENCH COLONIES.

THE SUGAR INDUSTRIES.

A circular letter on the position of the French Colonies has lately been addressed to the French Government and the members of both Chambers, and is drawn up and signed by Mons. E. Souques, President of the Syndicate of Sugar Manufacturers, and delegate of Guadaloupe; Mons. F. Bougenot, a landed proprietor and manufacturer of Martinique; and Mons. Micard, President of the Administrative Council of the Pointe-Simon Sugar Association of Martiniqe. The letter has appeared in full in the *Journal des Fabricants de Sucre*, and, although interesting and well reasoned ont, is too long for reproduction. The following table sums up the results of working in Guadaloupe, during five years, and is given by the writers in justification of the statement that the position of the industry has been decling during fhe last two years. With some notably exceptions, such, for instance, as Queensland, Java, Louisiana, the Hawaiian Islands, and natal, the same might be said more or less of nearly every cane-sugar producing country, and the reasons are too well known to need especial mention, and it is to be feared that even fhe clebrate *expose* now before us will not soften the hearts of the French Legislatuie to the extent of inducing them to grant the relief asked for viz., the *detaxe de distance* referred to in our issue for October, 1895, page 506.

Resumé of the Average Working of the 17 Largest Factories in Guadaloupe, 1889 to 1893.

Average of cane supplied:—		Tons.
By the estates belonging to the factories		288,987
By planters interested in factories ..		73,656
By independent planters		31,347
By small cultivators		41,788
Average total production of cane ..		435,778
Average cost price of cane per ton	fr. 20·79	fr.
Average cost of manufacture per ton	14·30	
	35·09	
Deduct for the spirit (tafia) ..	2·00	
Cost per ton of cane ..		33·09
Cost per 100 kilos of sugar, yield 9·69 per cent.. ..	34·15	
Export duty	1·50	
Sundry expenses, freight, loading, &c.	7·42	
Cost per 100 kilos., delivered in France..	43·07	
Deduct the average detaxe for the last 5 years	6·78	
Average cost per 100 kilos ..		36·29
Interest and sinking fund on borrowed capital are not reckoned in the above, but may be taken as about 3 fr. per 100 kilos produced		3·00

RESULTS OF 1893, 1894, AND 1895.

	1893. Tons.	1894. Tons.	1895. Tons
Production ..	41,158 ..	43,752 ..	30,000

In 1894, in consequence of the low prices, the crop fetched 14,659,778fr., against 19,993,626fr. in 1893, being a reduction of 27 per cent. In 1895, the amount was 7,500,000fr., a reduction of 62 per cent on 1893.

Some paragraphs, however, headed "Impossibilité d'une substitution de cultures," will have special interest for our West Indian friends, and we, therefore, supply a translation of them, remarking that the picture is painted in the darkest colours, this being of course the one of the writers. Perhaps a little less of calling on Hercules, and a little more of putting the shoulder to the wheel, as is being done in our own similarly situatod colonies, would commend itself more to the British mind.

"Impossibility of Replacing Sugar by other Products.—Now, what do they say to these unfortunate planters? Change your products; grow coffee, cacao, vanilla. Abandon 120,000,000 francs worth of industrial plant and meterial. Root up your canes.

They forget that it is not in the height of a crisis that such advice can be given to a country crushed under the effects of a series of bad years, and the high interest charged on the capital borrowed for their industrial plant and machinery. They forget that the only establishment which makes advances on mortgage charges 10 per cent interest, and that at the present moment it is of no use dreaming of finding cheaper money for the colonies, while the taxation of the planters is excessive in proportion to their production.

They forget that in the case of coffee five years, and in that of cacao eight years, must elapse before they begin to give a return, and that from 5 to 7,000 francs per hectare (£80 to £112 per acre). inclusive of the interest on the capital during the respective periods, must be expended on either of them.

And they overlook the fact that in the colonies the soil is not everywhere adapted for the cultivation of these products. Numerous experiments have been made, even at a height of 250 metres, which have demonstrated tho impossibility of success in many of the districts in which it was thought that they might have been cultivated, not to speak of the diseases which destroyed the greater part of the former coffee and cacao estates, and the cyclones which periodically ravage these countries.

The substitution of coffee or cacao for cane cannot be effected except in those parts of the island bordering on the mountains.

It will be seen, then, that in the case of by far the larger proportion of the land it is almost a material and financial impossibility to effect tho transformation in cultivation which is recommended to the planters, but it should be added that if the colonies were in a position to grow coffee and cacao instead of sugar, the home budget would have to sacrifice a larger amount than that now demanded from it for sugar, and there would be no possibility of employing all the hands now occupied in cultivation and manufacture, not to mention the decrease in the tonnage employed in the trado with tho mother country."—*Sugar Cane.*

BUGS AND THEIR ECONOMIC DESTRUCTION.

Singular as it may seem in face of the fact that the fumigation of fruit trees with hydrocyanic acid gas has been long and successfully before the fruit growing public, there are, however, a number of firms now in the field recommending other devices and materials for overcoming scale insects on fruit and tree. The arguments advanced by these traveling dispensaries of "cure all" remedies are at times suggestive of humor, were it not for the fact that they do succeed in palming off their goods to innocent purchasers. Again, it has come to us that a cheap cyanide of potassium has been offered with the assurance that it "is just as good as the 98 or 99 per cent pure." Like the effects in using inferior Paris green for spraying apple and pear trees for codlin moth, growers of citrus fruits using this cheap grade of cyanide will experience similar unsatisfactory results. You cannot wear a number seven shoe on a number nine foot; neither can you expect maximum results in any endeavor when using inferior materials. Verily, the best is always the cheapest.

The importance of using the gas remedy or fumigating for scale insects is forcibly brought to mind in the failure to introduce effective parasitical insects to feed on the red and black scale affecting citrus trees. After four years trial the ladybug business has proved abortive, unsatisfactory and detrimental to the fruit business in so far as it applies to these two scales. Fumigation is now the recognized remedy for these pests of the orange and lemon and is preferred to all other methods—indeed, it is no exaggeration to say that it is the only means affording absolute relief. But its uses are in some respects more important in the eradication of these insects on young nursery trees. When fumigated under the direction of experts, trees so treated are practically free from pests, and hence the planters can feel reasonably certain of clean orchards in after years. Viewed purely from a commercial point of view the use of hydrocyanic acid gas on citrus fruit trees subject to injurious insects is a money making proposition. Scaly fruit is at best a drug on the market and always brings a low price. Washing is often practiced to render such fruit marketable. In cases where it is resorted to the fruit is thereby more or less injured; besides, it costs more to clean it than it would to have fumigated the trees and thereby freed them and the fruit from scale insects.

During the period following its successful introduction some difficulty was experienced in securing cyanide of uniform strength and purity to generate a reliable gas. This invariably resulted in either damaging the fruit and tree by either too strong an application, or it was of insufficient strength to kill the insects. In either case the fruit growers sustained a loss. This difficulty, however, is removed by the introduction into this market of the celebrated and reliable cyanide manufactured by the Roessler & Hasslacher Chemical Company of New York City. This is guaranteed to be 98 to 99 per cent and is sold at a lower rate than any other make of the same quality. In view of these facts the fruit growers should avoid the cheaper grades at any price. The matter or reliability is not alone in that the percentages of the lower grades contain foreign substances that absolutely interfere with the cyanide of potassium they really do contain (no matter for what purpose used) in developing hydrocyanic acid gas. The question of price will at once be obvious by dividing tho price of the lower grade by its supposed percentage and multiply the result by 98 (the percentage of the chemically pure) the price equivalent in chemically pure for the lower grade is found.

The history of insect life is too minute to be entertained in a short skit dealing principally with its destruction. There are a few salient points, however, that should be considered as having a direct bearing upon the destruction of scale insects. Nearly all, or at least the great majority of insects, are hatched from eggs in the form maggots, caterpillars or grubs usually designated as larva. To fight injurious insects, successfully the best results are to be gained by destroying them in the first stages of their existence. Especially is this true of all scale insects, as before they become "settled" on limb and fruit and commence their "sucking" career and become encrusted with an impenetrable shell they are easily killed. It is right here where hydrocyanic acid gas fumigation by means of tents covering the trees proves its great efficiency. Its poisonous and destructive properties when discharged envelope the *whole* tree. Each and every part, the upper and underside of the foliage, every twig, limb and each individual fruit is enveloped in its deadly fumes and every bit of insect life is killed. Nothing could be more thoroughly, more destructive and farther reaching in its effects. Fumigation should therefore be practiced in every orchard in which there is any trace of infection, to the end that that the coming season may witness a great reduction in the enemies of our fruit trees. Tho proverb says that "cleanliness is next to godliness," and as applied to trees and plants it can be said that "cleanliness is the price of success" in fruit culture. Avoid a scale infected or diseased tree or plant as you would a pestilence, and profitable production of fruit, and vigorous growth of plant or tree will be your reward.

Too little attention has been given to tho eradication and suppression of injurious insects by orchardists in the past. The result has been that the warfare against them has become as essential a feature of successful fruit culture as cultivation fertilizing and pruning. The man who neglects it invaribly has an inferior crop of inferior fruit, and as a consequence finds that "fruit farming does not pay."

With the advent of keener competition and larger yields, the time is close at hand when only giltedge fruit will sell at all—and this cannot be produced in scale infected orchards.—*Rural Californian.*

THE CITRONELLA OIL SPECULATION.

It seldom happens that an entire trade is deceived on the position of an article. As a rule, a speculation cannot be under way very long before some one in the trade discovers the nature of the movement, and is guided accordingly in making his purchases. In the case of citronella oil, however, one of the cleverest manipulations recorded in any article in recent years was started a little over a year ago and carried to a successful conclusion, without the character of the movement having been discovered until manipulators had accomplished their purpose if the real character of the moment is now understood, the entire trade was deceived as to the real position of the article. The decline in price which commenced a few weeks ago not only excited comment, but on investigation brought to light a story which will be read with interest at this particular time. For several years previous to the Spring of 1895 citronella oil had ruled at a trifle over twenty cents per pound in large lots, and the consumption in this country had more than doubled from 1893 to 1895. The latter part of April, last year, the market commenced to advance, the price at that time being twenty-two and one-half cents per pound in large lots. It moved gradually upward until some dealers have paid as high as fifty cents per pound in January of this year for January-March or January-July shipment from Ceylon, sellers' option. At first excessive rains and later drought were given as reasons for the short crop which was reported, and light stocks were said to exist in Ceylon, London, New York and in other important markets. Undoubtedly the stock here was light, unusually large imports having gone into consumption. But it now appears that the advance was really "worked" by a London house with a Ceylon connection. This concern began buying oil at twenty-two and one-half cents per pound, and continued buying as the price advanced, reports being circulated at the proper time to account for the sudden change in the situation. They purchased the entire Ceylon stock, and so manipulated the market that the impression speedily gained currency that there had been a short crop, hence that there was a scarcity in the primary market. To keep up the delusion bids were made here by the above mentioned concern at intervals for lots to be exported to London, where the supply was said to be insufficient for the demand. When the price had been advanced to thirty-two cents the speculators quietly sold the large consumers in this country and presumably in England, without the knowledge of the dealers, some of whom, as already stated, continued to buy oil until it reached fifty cents. In their eagerness to obtain a quantity sufficient for what they considered their requirements, some even bought back contracts at twenty-nine cents, paying for them more than forty cents. In course of time, when consumers failed to make their usual purchases, it began to dawn on the mind of the trade that something more than the business depression was responsible for the stagnation which had prevailed for so long a time. The discovery was made by the dealers that they had been cleverly hoodwinked, but it was too late to enable them to recoup themselves. The market had already commenced to decline, owing to few offers from Ceylon of unlimited quantities and at low prices. Within two weeks prime oil, standing a well-known test, has been sold in London for steamer shipment from Ceylon, early delivery, at twenty-seven cents, cost, insurance and freight. Other sales are reported in the London market at thirty cents, steamer shipment until the end of June, and at twenty-nine cents steamer shipment until the end of August. Since these sales were made the market has stiffened considerably, the latest sales reported by cable Friday having been at thirty-three cents, cost, insurance and freight, for shipment from Ceylon.

Opinions differ as to the situation today. By some dealers it is thought the position of oil warranted an upward movement, although perhaps not to the full extent which the manipulators forced, while still others are of the opinion that an attempt is being made to again work the market. If the latter conclusion be the correct one, it is hardly probable that the dealers will be readily included in a second scheme of this character.—*Oil, Paint and Drug Reporter*, May 18.

THE BOOM IN RUBBER.

The boom in rubber goes on merrily. The price of best Para has gone up within the past few weeks from about 2s 9d to 3s 9d per lb., and it is thought by the trade that 4s or so may be reached. Owing to the limited sources of supply, the article, of course, easily lends itself to the manipulation of speculators and cornerers. But neither speculation nor demand for tyres is altogether answerable for the present high quotation. It seems that, owing to the recent dry season in the Brazils, traders have not been able to get their rubber down from the upper reaches of the Amazon, though this state of affairs may be remedied any day, when it is believed prices will give away.—*Home and Colonial Mail*, June 5.

AGRICULTURE.

COCONUT CULTIVATION.

It was but recently I enjoyed the advantage of reading in the "Agricultural Magazine" the article on the nitrogen question and of meeting and conversing with the gentleman whose observations on the influence of the sensitive plant on coconut cultivation are referred to. The problem of utilizing for agricultural purposes the vast stores of free nitrogen in the atmosphere had exercised the minds of agricultural chemists for a long while, as also the well-known fact that soil in which legumes and in particular clover was grown was found richer in nitrogen after than before these crops were grown. The researches of Hellriegel pointed to wart-like excrescences on the roots of these plants in which were bacilli which worked this all-important change. The benefit of this discovery to the European agriculturist was not great, for without being able to account for it, observation and experience taught him that clover as a rotation crop improved his land and gave him better crops. To us who grow perennials, the discovery of other plants as well, with these root tubercles which from analogy we infer are capable of converting the free nitrogen of the atmosphere into combined nitrogen for the use of vegetation, is of great practical value. But there is one thing which must be decided beyond doubt, that the bacilli in the tubercles on the roots of plants other than legumes perform the same functions as the bacilli found in the roots of legumes. So far, I do not think this has been done. Cultivated products are observed to thrive or grow better than otherwise, in the neighbourhood of certain plants or trees. The roots of these are examined and tubercles are discovered on them; the conclusion is that the bacilli in these tubercles perform the same function as those found on the roots of legumes.

It is interesting and profitable to know that the sensitive and other plants which grow wild on our lands as weeds have these tubercles on their roots. But has not the question yet to be decided that these plants exert a beneficial influence on the soil? That coconut trees thrive where the soil on which they grow is covered with the sensitive plant, is to my mind no conclusive proof that the improved appearance of the tree is due to the presence of this weed. The opposite conclusion is equally sound, that the presence of this weed is due to good soil. This weed is always found to grow on roadsides, which receiving the wash of the road

with animal deposits and crushed gneiss and gravel have necessarily rich soil. On an estate I had charge of, there was a rank growth of this weed on a flat at the foot of a hill which received much wash. Cinnamon grew luxuriantly here. Is the conclusion sound that the luxuriant growth of the cinnamon was due to the presence of this weed? One thing is beyond question, that this weed deposits large quantities of leaves, easily decayed, which improves the soil.

I must not be understood to state that the sensitive plant does not improve the soil or that the improved appearance of coconut trees where this weed covers the ground, is not due to it. All that I say is that proof of this is wanted. I was told by the same observer an experienced gentleman who discovered that the sensitive plant improves the soil, that the "pilla" performs the same functions. Previously I had not known this shrub by name, but observed that it grew round manured coconut trees chiefly. Here again there is the possibility that where coconut trees throve when this shrub covered the ground, the cause could be attributed as reasonably to good soil as to the growth of "pilla." I am no botanist, but the examination of the flower of this shrub showed a resemblance to the flower of the pea tribe. So that this, equally with the different varieties of "thora" which have similar shaped flowers, must be a legume, must have tubercular growth on the roots infected with nitrogen-assimilating bacilli, and must improve the soil it grows on. Anyone with observation will have remarked that wherever stiff soils have been manured by the tethering of cattle, a luxuriant crop of the different varieties of "thora" springs up. So that if it be the case that the soil in which these shrubs grow is improved, it is equally true that good soil is necessary for their growth. I examined the roots of the shrubs I have mentioned, but my inexperienced eye failed to detect the presence of tubercles.

If heaps of rubbish are burnt on sandy soils, the little organic matter they contain is burnt off and they are impoverished. This is testified to by the absence of all vegetation on such portions. If rubbish be burnt on heavy soils, increased porosity follows and of necessity increased fertility. This is evidenced by a rank growth of weeds chiefly the "balanakuta." I think it may be safely accepted as a rule that the presence in luxuriance of the different varieties of "thora" and of "balanakuta" on a soil is indicative of its fertility.

To revert to the sensitive plant. I do not think that even if it be established beyond all doubt that its growth improves the soil, many land owners will be found, even amongst the ordinary natives, who will foster its growth. It is a very troublesome weed and very difficult of extermination. If it be mamotied up and burnt, a more luxuriant growth follows. The great drawback with it is that it is so thorny. The periodical cutting down suggested in the "Agricultural Magazine" cannot be carried on but with shod feet. Picking and gathering of nuts on coconut plantations will become well nigh impossible. People can be found to grow "pilla," "thora" and other similar shrubs, but I do not think many people can be induced to grow the sensitive weed to improve lands. One way of keeping down this troublesome weed is with goats, but then of course the benefits of its growth will not be the same as when it is mowed down or dug into the ground. If any kind friend will send me a packet of the seeds of this weed, I will give it a test which I think will be conclusive, by growing it on a poor, sandy soil where the condition of the trees is not good.

B.

TEA IN DEHRA DUN.

The general aspect of the Dun, from the fact that it is overlooked from one of our favourite sanitaria, the road to which passes through it, must be well known to a large number of Anglo-Indians. The narrow, hazy, hot-looking strip stretching away far below Mussoorie, East and West, with the dark little Siwalik hills fencing it; in and then the misty expanse out and beyond. Within this tract—like to a variegated river-bed—have found a place and being nearly a score of tea plantations; and after many vicissitudes and change of hands, here they appear now to be fairly establishing their roots; they are living and doing more—in some notable instances they are fairly flourishing.

The Dun is one of the cradles of tea industry; and may from that evoke some interest; albeit it has always been—as it now is—quite a minor tea district.

It may be hazarded—the prediction—that it always will remain so; as will be, we think, seen further on.

And yet at first sight the newcomer; even if an experienced hand in tea, might not understand why this should be. For, coming at some seasons of the year certainly, everything would seem to him very much like anywhere else in the tea districts—would seem very much indeed at the first view like Assam. Fine stretches of tea would he see—beautifully grown large bushes, of Chinaját though they be. And all things would be very familiar: the Himalayas on the one hand although somewhat barer would still be the friends and brothers of the high hills so well-known elsewhere: likewise the little tree topped range away on the other side. He would see the rice—the *dhan* (the same old name) growing in the *khets* just in the *pothars*: he would meet his well-known clumps of bamboos, although less abundantly; and if he came at the right time would hear the old familiar bird with its re-iterated injunction to 'make more pekoe'!

Nor would he find much difference inside the tea buildings. Everything pretty much the same; except that more *pucka* work, *i.e.*, masonry, would meet the eye, both within and without and not quite so much the land of cane and bamboos: and he would recognise acquaintances of the latest date in the way of tea machinery. And the planter he would find very comfortably housed. 'Not much of the jungle here,' would probably be his expression.

Were he to come round when leaf plucking and tea making are in full swing it would appear just tea 'all over'; and were it in the bright and lovely cold weather, he would probably term the Dun 'simply glorious'!

Yet were our experienced friend to see the district in the heart of the high *hot* weather, he would, if there had been previous drought, have an increase to his experience: and might wonder if the dried and 'burnt' patches of plant would ever be green and vigorous again. On the whole, however, he could see that the bushes stood the alien conditions remarkably well; and were mostly green and healthy, though there were no flush.

A growing feature is the increasing abundance of shade. The shisham tree is a great favourite. The tea seems to like it and to do well—certainly to increase in thick bulk—wherever, near it as under it; and the shisham is fine-wooded tree—one of the most valuable.

Well, to come to the *tea* itself—the manufactured article infused. That would not meet with eulogy. It's but poor stuff, the Dun tea. Otherwise there would be fortunes to be made in the place; as labour is abundant and cheap; and the yield is very good, going up to 700 lb. per acre.

And why is the tea so poor there?

Well, in one word, 'climate.' The tea *is* poor; and it is likely to remain so. It has neither strength nor has it flavour, as these characteristics are understood by professional judges.

And yet it can be every nice tea to use, or fairly good certainly; especially if kept to season. A cup of good Dun tea is very nice. But its comparative inferiority often excites astonishment and incredulity in strangers. However, there it is; and that after many years' working; after the introduction of the best appliances; and with planters here who have worked in the districts where first class tea is made. A man who had been all over Assam told the writer up in these parts that the Dun was ten degrees too cold. But Kangra is probably colder; and also the tea localities about Darjiling. However, as compared with Assam the Dun seems not 'aromatic' enough. Assam is a richer, milder, moister climate; and one might well expect more

from the sap and the quickly grown parts of a plant there. In Ceylon it must be much the same. Before Indian tea had grown to its present great dimensions as a mercantile commodity—in the days when it was comparatively small; and when Ceylon tea was unknown—the Dun tea, black and green, sold very well. The black tea brought twenty years ago three times its present price. And green tea was a one thing in its day. It used to fetch high prices in Calcutta and London, for the finer kinds, certainly; while all classes of it used to sell well at the factory to Native dealers, for the Central Asian market. It was sold usually without any packing whatever—filled into the dealers' own bags; and as much would be got for low-class variety, so given them, rough and loose, as would be obtained for the best kind of black tea now-a-days in the Calcutta market, packed in good lead-lined cases, and sent there at the grower's expense, of course. This is correct. Yes! for 'Hyson skin,' unpacked, from five to six annas a pound would be given; and a Dun Orange Pekoe will not bring more now in Calcutta. In those time Dun Orange Pekoe would have brought its rupee a pound in Calcutta.

Considering that the Dun has always had, speaking generally, but, on the whole, we think correctly, a full and a free supply of labour; and that its prices used once to be very good, the disadvantage of climate might reasonably not have been held as a disqualification, although admitted as a drawback.

But the days of high prices have passed. The green tea market both of Central Asia and of England ceased long ago (well for philanthropic reason that in England, any how, it did; as the article was too intensely acrid to be possibly beneficial); and as to black, one might wonder if the Dun *did* ever stand on an eminence, so poor has been its place for long.

But the tea does go into use, nevertheless—all of it: and lately it has been well inquired for, and taken; from the Bombay side—a new quarter.

In the next paper I propose to treat of the position and prospects of Dehra Dun as a tea district—*Englishman*, *Cor.*

INDIAN FORESTS AND TANNIN EXTRACTS.

Our Indian Forests already yield a handsome income to the State, but no one knows better than the officers who work them that their full wealth is far from being developed. Mr. Ribbentrop, Inspector-General, has just issued to all Conservators a short letter covering an interesting paper by Mr. Fernandez on the preparation of tannin extracts, an industry which he recently studied during a visit to Europe. It appears that the export of myrabolams from India has hitherto only been limited by the supply and that an extraordinary development of the trade in cutch in Burma has taken place. Though cutch is very expensive it is, we are told, largely used as a tanning substance, its colour being extracted to fit it for this purpose. Experiments to obtain other extracts of an equal or approximate value from sal and assiana barks have not been successful, and so great is the trade demand that spurious substances are put on the Burma market. Mr. Ribbentrop remarks: "At the same time we know that tannin is largely contained in the fruits, leaves, bark and wood of many of our Indian trees and bushes, and that a forest industry of great potential value is only waiting for rational development." But the cost of freight comes in, as the raw material can only be exported in the compact shape of galls and fruits. Even in this form the tannic properties deteriorate, and it has become clear that if the trade is to assume its proper dimensions extract of tannin must be prepared in the forests themselves. Six years ago Dr. Watt recommended that experiments should be made in this direction, but no practical methods of carrying the suggestion into effect were made. This is the case as put by the Inspector-General, and he asks Conservators and the officers under them to take up the matter, and thus open out a new industry and new source of forest revenue. Mr. Fernandez' paper is of course, somewhat technical in character, but he shows that it is possible to utilise the enormous quantities of bark and wood which at present go to waste in our Indian forests and to convert them into tannin extracts for export to Europe, and even for use in this country. He describes the various methods in vogue on the Continent and gives the palm to that known as "Villon's process." This is explained in detail, with a drawing of the necessary apparatus, which could be made of wood, bamboos and stout cotton drill, if metal and wire gauze were not available. He adds that as no chemicals are required and as the entire process is within the comprehension of the lowest intelligence, the method is specially adapted for employment in our forests, however remote. It has the further advantage that it would admirably suit cutch manufacture. Mr. Fernandez sees a great opening for private enterprise if the Forest Department lead the way with experiments, and he holds that one of the functions of the Dehra School should be to analyse for tannin the bark and wood of all the likely species of Indian trees. His memorandum is one of great value, and copies of it might well be circulated to all our Chambers of Commerce. There is a fortune apparently for anyone who takes up the practical suggestions he has made for the manufacture in India of tannic extracts. —*Pioneer*, June 21.

THE AMSTERDAM MARKET.

Our Amsterdam correspondent writes on June 2nd:—The shipments of cinchona-bark from Java in the month ending May 31st, as declared by cablegram, prove to have been fairly heavy. The following are the figures for the past four years:—

	1896 Amsterdam. lb.	1895 Amsterdam. lb.	1894 Amsterdam. lb.	1893 Amsterdam. lb.
Month of May	768,000	402,700	400,000	711,000
January 1-May 31	3,260,000	2,879,700	3,288,000	3,241,000

The bark to be offered on June 11th amounts to 517,229 kilos, containing a total equivalent of 25,617 kilos sulphate of quinine, or an average of 5·05 per cent.—*Chemist and Druggist*, June 6.

THE MADRAS GOVERNMENT CINCHONA PLANTATIONS.—*Planting Opinion* of June 20th says:—We are glad to note that Mr. W. M. Standen's appointment as Director of the Madras Cinchona Plantations has been finally gazetted. Our readers will remember our prediction to that effect some months ago. Mr. D. Hooper has been appointed as Government Botanist, a post which, unluckily, is only a temporary one, otherwise much real benefit might have been derived by the Planting Industry during Mr. Hooper's tenure of office. His well-known sympathy with all lines of practical agricultural research, and his unquestioned attainments as a Chemical Analyst, fitted him pre-eminently for his post. The so-called experimental gardens at Burliar and Gudalur will, we trust, be worked with some little show of trying to attain the objects for which they were started. But as long as they remain under the direct control of the Superintendent of the Botanical Gardens, we much fear that his multifarious duties of keeping up a good show of flowers and maintaining the grass plots round Government House in a healthy green condition will effectually prevent any serious work in these gardens.

DR. TRIMEN'S WORK IN CEYLON AND LOCAL CRITICISM.

On the eve of the final departure of the Director of the Botanic Gardens, it may seem a little unkind and invidious to enter on a controversy as to the merit and usefulness of his administrative, economic, and scientific services to the community. But to compare Dr. Trimen's work with that of Mr. Hart of Trinidad—useful officer as the latter is in his own sphere—as was recently done by a planting correspondent of the *Observer*, is simply absurd. Take Dr. Trimen's latest work: "THE FLORA OF CEYLON" in three volumes—why, it is impossible to overestimate the value of this work for practical, educational, and scientific purposes in the Colony. For thirty years, we had been accustomed to listen to, and read, the late Mr. A. M. Ferguson's earnest desire that such a work should be prepared for the benefit of all who took an intelligent interest in the vegetation of the island. Dr. Thwaites's great work on Ceylon plants might well be complained of by any "practical planter" as above his head—being essentially a scientific botanist's book. But Dr. Trimen, while taking care to serve the purposes of science, and to be as full and correct as any reasonable botanist could desire, has added a series of most useful economic notes which simply make his work a treasure-house to the ordinary intelligent readers,—to all in fact who wish to know what can be said about each of our plants (useful and ornamental) and especially about the timber trees and economic products of the island. That the highly accomplished and worthy Director should have persisted in this important undertaking to the sacrifice of his health, if not of all that makes life worth living, speaks highly for his conscientious devotion to duty and deserves the grateful acknowledgment, not only of the Government, but of every right-thinking man in the community. So much for the most important single work, perhaps, which has marked Dr. Trimen's Administration. But we are equally clear that never before in the history of the island has more attention been given in our Botanic Gardens to every question bearing on the economic as well as scientific side of planting, and tropical agriculture generally, than during the past fifteen years. We speak of that we do know; for as editor both of daily and monthly issues, we have continuously been made the medium of requests for information, of puzzling questions, of plants forwarded for identification by planters—not to speak of our own many editorial queries—and we have never failed to receive the most prompt and satisfactory attention from Dr. Trimen.

But we are prepared to meet the planting criticism referred to at closer quarters; for, in reality, it must have been written with entire forgetfulness of the policy which has guided both the official and planting world in India, and Ceylon, for many years back. The critic is perhaps unaware that in recommending the Government Gardens, or any portion of them, to be devoted for the growth for *market* purposes of cacao or any other product, for which planting attention is given, he is contravening the principle, so stoutly fought for in India even in the present day, of non-interference by Government with private enterprise. Merchants and planters in India, for instance, have protested on this ground against even the Government Cinchona Gardens—although nearly all the bark is now manufactured on the spot into alkaloids for distribution under official auspices, and little or none sent into the open market. The Ceylon authorities long ago learned the lesson not to interfere with private enterprise in any planting direction: and we feel sure that the vast majority of our planters, as of intelligent natives, desire the same policy continued, by which while all new products are carefully tried and cultivated and a stock of seed or plants maintained for sale and distribution of new and certain old products or plants, no attempt is made to rival the tea, coffee, cacao, cinchona, rubber, &c. planter, even in a small way by establishing a permanent garden of any one of such products.

We can only smile at the idea of bringing the West Indies into comparison in such a connection. The West Indian planters—as Messrs. Arthur Sinclair and H. Ross told us long ago—are many years behind those of Ceylon. Dr. Morris bewailed to us not long ago that there was not even one enterprising, intelligent editor in the West, to stir up and lead the planters in respect of new staples and industries; and very few planters who would take the trouble to try or plant anything new. No wonder, therefore, though Mr. Hart, and other superintendents of gardens have had to turn to work as planters and tropical editors in a small way. But how different the case in Ceylon: is there a new product mentioned in our *Tropical Agriculturist*, or the local daily press, or the Peradeniya annual report, that is not at once indented for, planted and tried in several districts in Ceylon? Be it kola, coca, rubber in new species, cacao in fresh varieties,—are there not planters ever ready to save the Government officials, whether at Peradeniya or Hakgala, from doing more than give them a lead with all the information and instructions available, in order to find the fullest and amplest trials given and that too in the most practical fashion? As to the Trinidad monthly or quarterly bulletins being offered as an example worthy of copying at Peradeniya or Hakgala, we not only protest as editors and publishers in the name of common-sense and private enterprise; but we take it as unkind (only it was from want of thought) on the part of the planting correspondent, to offer such criticism or suggestions, forgetful of how completely the *Tropical Agriculturist* covers the ground. This monthly periodical has been *officially* recognised not only in Ceylon and India, but by many of the West Indian Governments, in New South Wales, Fiji, South Africa &c., and is carefully filed by the Agricultural Department at Washington, United States. Dr. Trimen, and his subordinate officers, especially Mr. Nock, have ever been among our readiest supporters in supplying information and suggestions for the improvement of this almost unique tropical periodical which is so widely distributed and generally prized not only by planters but by garden and scientific authorities. We feel sure that, on reflection, the planting critic of Many will see that the points of complaint he puts forward against the administration of our Royal Botanic Gardens are, in reality, pointless—and indeed, tend rather, to justify the soundness of the policy pursued; while we are absolutely clear that no more valuable Reports—both from an economic and scientific point of view—reach us from any Botanic or Government Gardens the wide world over, than those that bear the imprint of Peradeniya.

INDIAN AND CEYLON TEA.

Messrs. Thompson's Annual Review,

38, Mincing Lane, June, 1896.

The completion of the year ending 31st May brings an opportunity for reviewing the characteristic features of the season, and summing up its results.

For the kindred industries of India and Ceylon, the year has been one of expension. Production has continued to increase; consumption at home has been larger than ever before; and trade with other countries has made a marked advance,

To growers the season has brought substantial, though not uniform, remuneration—not, indeed, to the full extent of last year taking the actual sale price of the product as the measure of success, but so considerable in comparison with the general earning-power of capital as to make this Industry conspicuous by contrast with others, and to enhance the value of all good properties.

For individual producers, however, and specially for managers abroad, interest centres upon the result of their own year's work; and those who have been less successful than others will desire to know the reason. To find it we must look back to its position as it was a year ago, and trace the unseen influences affecting the market and causing fluctuations in value—in doing so we may find some light thrown upon the future.

At that time a fine and rather short crop had been closed at prices, if not inflated, yet so high as to check consumption and let in cheaper kinds from China and Java—leaving all holders of stock with dear tea, and inconvenienced by the loss entailed by the process of pushing it into use. Then came from abroad estimates of heavy crops, not indeed destined to be realized—as they rarely are—but put forth with sufficent authority to make buyers anxious. With the arrival of the new Indian teas came a foreshadow of a poor crop, with signs that planters, inflenced by high rates for common tea were plucking course. The heavy supplies received in the Autumn, and exaggerated reports circulated about shipments, deepened impressions already formed, when values in London moved in the directions they usually take if crops are large and not of good quality—and remained there.

A few who had foreseen this state of things, and were in a position to do it, made the best tea possible—to their great advantage, as it proved. Others relied upon a large yield and a low cost: they, as a rule, have done well; while some who took a middle course, and had neither a fine crop nor a sensational yield to help them, have only done moderately.

Such, in broad outline, is the history of a season offering many points of contrast to that of 1894, but resembling that of 1893 in the higher price of fine tea; the lower price of common; great and growing consumption, and a wider demand for our teas from abroad.

That this is a sound position for the Industry, as a whole, is not open to question—though it does not suit all equally well; for it will encourage the production of the good tea required for home use, and will facilitate trade with Asia, Australia, and America which for the present turn upon the teas used there being procurable at low rates.

Writing a year ago about this foreign trade, upon which so much will depend a few years hence, we said "The development will be seen when there is plenty to spare from the home market, and quotations are not maintained at a level which checks it"——events have proved this to be true; lower rates have been fellowed by a great expansion of trade with other market; which must be taken as a partial set off for the disadvantage of low prices to those who produce an inferior class of tea.

Were it not for evidence of the gradually widening world's demand for Indian and Ceylon tea, many producers——and especially those who are contemplating further extensions——would need seriously to weigh these questions—1. Has the limit to which cost can be reduced been reached? 2. Is there *any* limit to the possible fall in value of common tea?

The influence of foreign orders upon the Calcutta and Colombo markets has been considerable; it has often made values there, for the sorts taken, independent prices ruling here. This has not been sufficiently recognized by those who send, or by some who execute, orders from London:—for the future it will be necessary to be more circumspect, and to adjust buying prices to those current in the place of destination, remembering that if operations in the limited markets of India are attempted on the scale of China business in olden days the result will be disappointing.

Another result of orders from new markets has been to accentuate the preferential value of leafy as compared with broken teas, for brokens are not saleable abroad, and here fewer buyers seem to bid for them every year, bringing their value below that of leafy tea. One reason for the disfavour in which small broken teas are held is to be found in the tendency of business to pass into the hands of those selling "blended" tea who habitually give the preference to whole leaf.

The development of this branch of trade continues to make progress, and it is an element of importance in the market—for the Blenders are teaching the retail distributor to do without holding stock, and their system saves both themselves and their customers the loss on tea that has depreciated by keeping, and on remnants of old stock, which has always been such a drawback. The shrinkage of old stocks in grocers' shops cannot be measured, but it must be considerable, and combined with the comparatively light stocks now held in bond it has strengthened the position, and accounts for the fact—exceptional in produce markets—that, apart from the slack time in the summer, wholesale buyers are always operating, and are ready to do so heavily at favourable opportunities.

The buying-power is, indeed, stronger now than it has ever been, partly, perhaps, because by force of circumstances the tea-trade has become closely allied with the provision-dealing trade of the country; partly from the strength that comes with the increased capital attracted by Joint-Stock enterprise; partly from the greater *usefulness* of capital in the hands of strong Co-operative combinations interrading on a cash basis. This is a matter of no little importance; for it is impossible to avoid placing excessive supplies upon the market at certain times; to absorb them, wholesale buyers with ample means and the will to use them are required.

The *ideal* policy for an Indian producer is to offer an equal quantity of his brand at regular intervals from August to April, giving the market a rest in the summer and buyers a chance of turning over their stocks. By degrees this is being followed, but it cannot be worked symmetrically or by all and Calcutta-bought teas cannot generally be handled on these lines.

Importers of Ceylon Tea have from the outset seen the wisdom of regular Sales at the rate of importation, arrivals being sold, as a rule, within three weeks, and the first step taken to pass them quickly into use. The result is seen in a large trade worked upon a small stock, and the desired increase of consumption attained.

Much interest attaches to the progress of the Ceylon Industry, and it is being closely watched by competitors elsewhere for signs of the deterioration that some were led to expect; but upon the whole we consider that the average *quality* of Ceylon Tea is being maintained: its average *value* has declined somewhat, it is true; but other growths have been subject to this and the fall this year is due to the policy of those who have found it profitable to make heavy crops instead of smaller and finer ones:—they have brought to market tea of lower grade than used to be or need be made, and in doing so have widened the margin between the value of common and fine. Should they revert to making lighter crops, the average *value* would quickly rise, but it does not follow that a larger *profit* would be secured.

Will this movement in prices, common to India and Ceylon alike, be further accentuated in the future? It will depend upon the amount and the quality of the coming crops:——should they fall short of the world's requirement, we may see it reversed; but if ample, producers should be prepared for low rates for all inferior kinds.

As regards the home trade, we anticipate a growing appreciation for the fine-flavoured varieties, whether grown in Assam or on the hills of Darjeeling and Ceylon; and for this reason——the competition to sell "cheap" tea seems to be wearing itself out; the public has had enough of the "shilling canister," and the vendors find they do no good by selling it; consequently, their aim is now to make trade by selling good tea at a reasonable price. This will probably determine the course of the market such time as a short supply, or a specially fine crop, lifts the value of the lower grades.

Respecting the prospect of receiving more fine tea from India, a high authority in Calcutta writes to us, "In late years the policy throughout Cachar and Sylhet has been to plant on flat lands; this means quantity not quality. The larger proportion of extensions in recent years has been made in these districts and in the Dooars, the most fertile land and prolific jats being selected. It is, then, apparent that the *proportion* of land calculated to produce fine tea diminishes as we progress; and we are of opinion that the gardens in Assam and Darjeeling which can produce fine quality are in a strong and possibly improving position." As in Darjeeling, so too, we believe in the districts of Ceylon which give the finer qualities, the land remaining available for plantations is limited to a small area. There remain Travancore and the new territories being opened in the South Wynaad; both of these districts seem capable of producing fairly good crops at a comparatively low cost, but they have not yet proved their capacity to yield tea equal to the finer grows of India or Ceylon.

WM. JAS. & HY. THOMPSON.

CAMPHOR.

Camphor is not the exclusive product of any one natural order, genus, or species; but what is more remarkable, of closely allied species of camphor-yielding genera—one species possesses the secretion, while no trace of it is found in another. Although several kinds of camphor are articles of commerce, little, if any, reaches this country, save that obtained from *Cinnamomum camphora* (*Camphora officinarum*), a member of the laurel family, and of tho same genus as the tree whose bark furnishes the spice called cinnamon. Like many other natural products of which scientific research has multiplied the applications, camphor is becoming dearer and scarcer, and tho question has arisen, How is the supply to be maintained equal to the demand? The bulk of the camphor imported into Europe comes from Japan and Formosa, and comparatively little from China. This is the product of *Cinnamomum camphora*, and Dr. E. Grasmann has published* an interesting account of this tree, both from a scientific and commercial standpoint. He has rather overweighted his article with second-hand information respecting laurels generally and those of Japan in particular, which, as might be expected, is inaccurate in some details. Disregarding these, we find much that is interesting concerning the camphor-tree itself, which is one of the noblest objects in the forests of eastern sub-tropical Asia. It attains gigantic dimensions, surpassing all other trees of the Japanese forests, at least in girth of trunk if not in total height. Dr. Grasmann gives the recorded dimensions of various notable trees, but what is more to the point, he also gives measurements made by himself. A tree in the neighbourhood of the town of Miyazaki, Oyodomura, measured in 1894, was 14·80 metres in circumference at 1·30 m from the ground, or 4·48 m. in diameter, and it was 35 m. high. There is an illustration of this giant reproduced from a photograph. Concerning the distribution of the camphor-tree in Japan, the author states that it grows naturally in Kiushiu up to about 34 deg. lat., and scattered in favourable situations some 2 deg. farther north, the extreme limit being 36 deg. 24'. It is abundant in the island of Formosa, and also occurs in the Tsusima and Luchu groups. On the mainland of China, according to Dr. Grasmann, it inhabits the coast region from Cochin-China to the mouth of the Yangtzekiang, and it may be added that it is now known to extend westwards at least as far as Ichang in the central province of Hupeh. From Dr. A. Henry's notes accompanying his specimens in the Kew Herbarium, it appears that the wood is in great request, but no camphor is extracted; and Consul Playfair reported the same from Pakhoi, Kwangtung, in 1883. Indeed the camphor industry would seem to be at present very limited in China, although the tree is common and widely spread. The little that is exported is mostly from the province of Fokien, but the amount is increasing in the same measure as the production is decreasing in Japan. In the latter country something has been done to maintain the supply, but Dr. Grasmann holds that the present rate of planting is wholly inadequate. He urges the importance of increasing the plantation to the greatest possible extent, inasmuch as every part of the tree is useful, from the roots to the young shoots and leaves. Even the fruit is employed in the preparation of tallow. In Formosa camphor distilling has been carried on in the most recklessly extravagant manner imaginable. It is suggested that Japanese rule in the island may put a stop to such disastrous waste.

With regard to the increasing price of camphor, it has been stated in various publications that this is due to its being used in the manufacture of smokeless powder. In reply to inquiries on this point, Sir Frederick Abel wrote to the Director of Kew in November last as follows:—

"Any increase of demand, involving a rise in tho price of camphor, is not duo to its application as a constituent of smokeless powder. That material was used in the earliest days of the manufacture of a successful smokeless powder for artillery and small arms; but its employment was soon demonstrated to be attended with serious practical disadvantages, and its application for the purpose can therefore not be said to have been other than experimental, and of no great importance, even at that time, as affecting the market value of camphor. This substance has, however, been used extensively for many years past, and no doubt in continually-increasing quantities, for the conversion of collodion cotton into the material known as celluloid, which is applied to the manufacture of imitation ivory, tortoise-shell, horn, and a great variety of purposes."

As Dr. Grasmann observes, the greatest enemy of the camphor-tree is man, and in Japan large trees are eventually killed through the felonious nocturnal grubbing of their roots. Some birds are fond of the fruit and seed, and the caterpillar of *Papilio sarpedon* feeds on the leaves; but, except to young plants, they cause comparatively little damage. Apart from tho wanton destruction of trees, the probability of the supply of camphor being maintained is seriously diminished by the fact that the tree grows but slowly in its early years. At the same time it colonises freely, and is now naturalised in several countries, notably in Madagascar, where, according to Dr. Meller, in a note accompanying a specimen in the Kew Herbarium, it was abundant as long ago as 1862, and much used for building purposes.

Next in point of importance in producing camphor is *Dryobalanops aromatica*, a tree belonging to the Dipterocarpeæ, and inhabiting Borneo and Sumatra. The formula of ordinary camphor is $C_{10}H_{16}O$; of Borneo camphor, $C_{10}H_{18}O$; and the latter can be artificially prepared from the former. Borneo camphor is deposited in clefts and hollows of the wood, and has simply to be taken out; but it is comparatively rare, and exceedingly dear bring-

* "Der Kampferbaum. Mittheilungen der deutschen Gesellschaft für Natur- und Völkerkunde Ostasiens in Tokio," vi. pp. 277-315, with illustrations. 1895.

ing eighty times more, according to Grasmann, than ordinary camphor. Nearly the whole production is imported into China, where it is esteemed beyond the ordinary camphor, and used as incense.

Blumea balsamifera (Compositæ), a shrubby plant exceedingly common in tropical Asia, yields a kind of camphor by distillation. Hainan is the principal seat of the industry, but the crude article is refined at Canton, whence there is an annual export of about 10,000 pounds. No doubt this source of camphor could be much more extensively utilised.

Members of various other natural orders, notably the Labiatæ, yield essential oils of the same composition, and having the same properties, as camphor. Menthol is an example. W. B. H.
—*Nature*, June 4.

THE SIZE OF THE BREAKS OF CEYLON TEA.

The following memorial has been drawn up and signed by fully forty of the largest buyers in the tea market:—

To the Brokers' Association.

Gentlemen,—We, the undersigned, buyers in the Ceylon tea market, beg to call the attention of your committee to the urgent necessity of taking steps to increase the size of the sampling breaks for public sale to at least the same limit as now prevails for Indian tea on the following grounds:

I. The increasing difficulty, if not impossibility, of accurately valuing so many samples for one day's sale.

II. The saving of time to be effected in the auction room, which would be invaluable to all concerned, and would admit of buyers being able to have their purchases sampled and sent out on the same evening.

III. The extra expense and labour involved in sampling so many small lots after purchase, and in furnishing samples of them all to our agents.

We desire also to take this opportunity of expressing an opinion that the number of grades into which Ceylon tea is sorted might advantageously be curtailed, more especially as regards the produce of the smaller gardens. We also think that the smaller gardens might be advised not to dispatch their produce more frequently than once a fortnight instead of weekly. And we also deprecate the practice adopted by some, even of the larger gardens, of offering duplicate invoices on the same day.

Begging the favour of your early consideration of the foregoing suggestions.—We are, &c.

[Here follow signatures.]

Our readers will remember that we foreshadowed some such action before the holidays, and the above is the outcome of the rumours then current. It is to be hoped that due consideration will be given to the arguments adduced, as with quantities on sale such as last Tuesday, when 27,462 packages were offered in 916 lots, there seems to be urgent need for some alteration in the direction indicated if the trade is to be got through in any sort of reasonable time. In the old days of China tea one sample frequently represented 300 chests, sometimes 600 chests, and whilst it is not suggested that Ceylon planters should all at once adopt a similar limit, there is no reason why the present average should not be largely increased.—*H. and C. Mail*, June 12.

COFFEE IN MEXICO.

Our Legation at Mexico have sent home a special report upon the cultivation of coffee in Mexico, prepared by Mr. Francis Stronge, in which he points out in detail the advantages and difficulties attending the profitable employment of capital on a limited scale in the country. In purchasing an estate in Mexico a new comer should, as a rule, have recourse to a reliable foreign agency. Direct negotiations with the owners of the soil are often extremely tedious, and they should not be undertaken by anyone who does not possess a thorough knowledge of the country. Care must, of course, be taken to obtain a good title to the land purchased, and in most cases this can now be done without much difficulty or expense. In some districts the Indian villagers lay claim to certain rights over adjoining lands, and however unfounded such claims may be, they are sometimes a source of great annoyance to the foreign planter. It will almost always be found, however, that these difficulties may be overcome by a little tact and liberality. The intending planter will generally do well to spend some little time in the country before making a purchase, and should, if possible, acquire some practical knowledge of his business at an existing plantation. He will be apt to think that by waiting he is letting slip many a golden opportunity; but such opportunities will probably recur later, and the experience he will have gained will save him much loss and disappointment. A considerable number of small foreign capitalists in Mexico would probably admit that for a year or two after their arrival experience was their only profit, and that it had been gained at a needlessly high price.—*Financial Post*, 9th June.

THE ISLAND'S SOURCES OF SUPPLY OF TEA BOXES.

There being short supplies of tea shooks and consequently higher prices, our contemporary has been gathering information on the subject, which is stated as follows:—

Our representative first waited upon probably

THE LARGEST IMPORTER,

who, owing to his direct connection, has heard from a large Japanese house the causes of the present condition of affairs. This gentleman kindly informed us that he understood that the shortage of supply was owing to the demands of the Japan Government for this particular Momi timber for putting up huts in Formosa. At this time of year also—lasting from July to December—there were the important requirements of Calcutta, while he also believed by this time the trees in Japan most easily available had been cut down, and now the exporters had possibly to go further inland and greater distances from river banks for the timber. These various causes had combined to seriously diminish the supply, and send up the cost 20 per cent. There was still a small demand here for cedar wood—which might be the original *Cryptomeria Japonica*, he was not sure. That wood was dearer than Momi, which was not a botanical name, and did not mean "pine," although a Japan pine supplied the wood. The difficulty to meet requirements—or at any rate the higher prices—would last, the speaker thought, until next December, after which, for six months, the Indian demand would cease. As to whether prices had reached the point at which European supplies—particularly Swedish and Austrian—could be imported the difficulty had always been the position of exchange, and there was not more prospect of a 1s. 4d. exchange now than in previous years.

THE LARGEST SINGLE CONSUMERS

were next interviewed. Last year when there was an anticipated rise in price they had imported from Europe; but had not taken steps to do so this year not caring for the business. Owing to the scarcity of boxes, however, they had commenced to refuse outside orders, confining themselves to the supply of their own estates, and those for whom they were recognised agents. Former customers had written urgently for supplies, as some of their tea was having to be stored in the absence of boxes; but these could not be sent. It was not anticipated that there would be much actual loss of tea, because it would keep in the factories allright for a long time; but inconvenience was being caused in some quarters.

A LARGE AGENCY FIRM,

who are their own importers, not being sellers to others, could only say that although they were paying more in Japan, they were not handicapped in supplies; and a further consignment for them was actually on its way to Ceylon.

ANOTHER IMPORTING FIRM'S EXPERIENCES

were that just now it was of little use to send forward orders, the European house in Japan with whom they dealt having so writing, at the same time appending the following explanation:—"The (Japanese) Government have taken all the available cut supply for Formosa." This firm had not made arrangements for the importation of shooks from Sweden, but they understood another firm had placed large orders for Austrian pinewood chests. Regarding locally made tea chests orders had been placed with the Udagama Tea and Timber Company at Galle, but their output was limited to about 400 chests a day. They were cheap, but the wood, of course, was not so good.

AN IMPORTER FROM EUROPE.

Our representative finally waited upon the importer of Austrian pinewood, who at present is the only importer of shooks from Europe. He stated that he had placed immediate orders for 20,000 chests, and he had booked a number of orders for delivery during the remainder of the year. He had not imported since 1893, until he sent home telegraphic orders three weeks ago. The non-resinous pinewood shooks which he was selling were also of even tare, and this question was a very important one. Locally made boxes did not ensure even tare by any means, and even Momi boxes were sometimes defective from this point of view. Uneven tare meant loss to the planter, and gave dissatisfaction to the London importer.

TEA IN JAVA.

From a pamphlet entitled "Cultures in Nederlandsch Oost-Indië," compiled from the Dutch Colonial Report for 1895, and issued by the *Indische Mercuur*, we translate the following regarding tea in Java:—

ESTATES ENTIRELY DEPENDENT ON CONTRACTS WITH THE NATIVES.

The tea plantations opened by the natives on their own lands, in the vicinity of some of the tea plantations established on emphytentic lands in the Preanger Regencies, namely in the districts of Tjitjoeroeg and Djampang Tengah in the Soekaboemi division, which according to the previous report at the end of 1893 covered a collective area of 430 bouws,* are gradually becoming of more importance to them, since in 1894 299 bouws more or less were in bearing, against 168 bouws in 1893. In 1894 in the case of four emphytentic plantations the gathered wet leaf was bought at 3½ to 5 cents per ½ kg.,† namely, on Parakansalak, Tendjo-Aijoe, Sindangsari and Pasir Telaga Warna the produce of respectively 120, 89, 74 and 6 bouws. In this manner the plantations referred to obtained respectively 179,052. 73,708, 72,625 and 5,250, or in all 330,645 kg. of tea, whilst in 1893 under the outturn of the three first named plantations was included under the category of tea thus bought 186,709 kg. of tea, obtained from the aforesaid 168 bouws. When one considers that the gardens are laid out on lands which are unsuitable for *sawahs*,‡ and that with good management they will yield crops for at last 25 years, the profits from rice cultivation in the Soekaboemi division, which every year requires so much labour, cannot by far be compared with the results already obtained by the natives from their tea cultivation; it is therefore considered very probable that in the near future in the Preanger Regencies the voluntary planting of tea by the natives will gain in importance. It is calculated that a bouw of planted tea yields the owner a gross return of about *f*75 per annum.

In the Limbangan division of the district mentioned the preparation of tea finds a place—solely for the inland market—on the native plantations of Tjigasang, Pasir Tjitjoeroeg and Tjigedoeg, which consist respectively of 1½, 2½ and 4 bouws of land possessed individually by inheritance. In 1894 there were prepared on these plantations 2,657 kg. of tea, against 2,501 kg. in 1893, which product was sold in the bazaars by hawkers at a fixed price of *f*0·40 per kg.

LANDS GRANTED BY THE GOVERNMENT IN EMPHYTEUSIS OR ON LEASE.

If, out of the 96 emphyteutic plantations, where at the end of 1894 cinchona plants were still found, 67 were in the Preanger Regencies alone, that district, so far as tea plantations are concerned, aspired even higher to the front rank, since 47 of the 50 plantations where tea cultivation is carried on on emphytentic lands were found there. The crop from the newly opened plantations of Assam tea in the higher lying Preanger Regencies go on increasing; this increase counterbalances the decline in the produc tion of Java tea in the lower lying regions, where the plants of Java tea are becoming more and more replaced by Liberian coffee trees. In consequence of this the tea crop of 1894 remained almost stationary. The crop amounted in 1892 to 3,794,932 kg. from 34 plantations, in 1893 to 3,405,042 kg. from 35 plantations, in 1894 to 3,421,013 kg. from 32 plantations. As regards the extent of emphyteutic lands planted with tea, so far as relates to 7 plantations (all in the Preanger Regencies) no figures are available (none also for 1893). The remaining 43 had at the end of 1894 10,263 bouws of tea plants, the total at the end of 1893, for 40 plantations, being 9,907 bouws. In these totals the Preanger Regencies residency shared at the end of 1894 (for 40 plantations) to the extent of 9,130 bouws, and at the end of 1893 (for 37 plantations) to the extent of 8,798 bouws. Some of the last-mentioned 40 and 37 plantations consisted at the time of only small fields (⅛ to 10 bouws).

LANDS GRANTED IN POSSESSION TO PRIVATE PERSONS

The tea production of the lands granted in possession to private persons amounted in 1894 to 675,850 kg. (for Tjikandi-Oedik in Bantam with 93 bouws of tea, Tjikoj in the abovementioned division of Tangerang, where 125 bouws more or less are planted with tea, and 18 lands in Buitenzorg with about 3,700 bouws of tea gardens).

On single Buitenzorg lands steps were being taken to replace the tea plants by Liberian coffee.

* The *bouw* (Malay *bahu*) = about 1¾ acre.—Ed. *C.O.*

† The half-kilogram = 1·102 lb.—Ed. *C.O.*

‡ Irrigated rice-fields.—Ed. *C.O.*

INDIAN TEA ASSOCIATION.

From the Abstract of Proceedings of a Meeting of the General Committee held in Calcutta on 29th May we extract the following:—

With reference to the Chapter on "White Ants" written by Dr. George Watt, C.I.E., for his Report of his investigations in Assam with proof copies of which he had favoured the Association, letters had been received by Messrs. Shaw, Wallace & Co., from Mr. John Alston, Superintendent of the Assam Frontier Tea Co., Ld., and by Messrs. Finlay, Muir & Co., from Mr. James Hall, South Sylhet Tea Co., Ld. It was decided to pass these letters on to Dr. Watt for his information.

Mr. Wallace suggested that the question of appointing a Scientific Officer for the Tea Districts should be referred to the various Boards of Directors of tea companies in London before the Committee arrived at any decision here, and it was decided that the correspondence and papers on the matter should be summarised and sent to the Secretary, Indian Tea Association, London, for this purpose.

Considered letters of 17th and 24th April, and 1st and 8th May, with enclosures, from the Secretary, Indian Tea Association, London, all more or less in connection with the American Market Fund.

Letter of 1st May, enclosed copy of an important letter from Mr. Blechynden, dated 20th April, making suggestions in detail with the view of bringing the trade in Indian tea in America on to the same lines as followed for China and Japan teas. Mr. Blechynden pointed out, that the trade in China and Japan teas was based mainly on the samples of the previous year, each mark having its recognised standard, and that large orders were booked months ahead on prices quoted, subject to market fluctuations, the importer taking only ordinary commercial risks. Mr. Blechynden's proposals, stated

briefly, were to organise in India an Agency which would take the place of the packing houses in China and Japan, and he suggested the formation of a trading company or syndicate which would undertakes to buy teas in Calcutta and to blend and pack them, to certain fixed standards, shipping them against orders from America, the main points to be aimed at being the minimum of cost and thorough efficiency. The difficulty of matching any particular sample of tea which had attracted the popular taste was one of the chief difficulties in pushing the trade in Indian tea in the United States, and in order to get over this Mr. Blechynden suggested forming a number of standards of different commercial grades and of the style and liquor found by experience to suit the American markets. Such standards would cover practically all the kinds required and range in prices from the lowest to the highest grades, and a sufficient number of teas should be used in each blend to admit of their being followed whether the same gardens or district teas were available in the next season or not. In this way he considered it possible that large firms, who are not at present handling Indian tea, could go into the trade and sell large quantities.

These proposals had been considered at a meeting of the American and Foreign Tea Committee, held in London on the 5th May, but after due consideration the Committee came with regret to the conclusion that the scheme submitted was beyond their scope to deal with, but they concurred in the view expressed by Mr. Blechynden in a later letter that some effect might possibly be given to his proposals by private enterprise.

After careful consideration, both in circulation, and in the course of discussion, the General Committee arrived at the conclusion that Mr. Blechynden's proposals were not practicable, the main obstacle for carrying them out in this country being the unsuitability of the climate for blending purposes. The Committee, however, suggested that arrangements might be made for blending Indian teas on a large scale in America, which might meet the difficulty, and this was to be passed on to the London Committee. The General Committee noted the views with which Mr. Mackenzie had favoured the American and Foreign Tea Committee in London as detailed in Mr. Tye's letter of 8th May.

In his letter of 24th April, Mr. Tye called attention to the prejudical effect on the trade of the North-West frontier of the unwise fiscal policy of the Amir of Afghanistan and the consequent falling off in the exports of Indian tea as shown in the official statement of the trade of British India for 1894—95, and stated that the London Committee were of opinion that a representation should be made to the Government of India on the subject, with a view to a removal of the restrictions referred to. The Committee having given very careful consideration to the matter were of opinion, looking at the very full and clear statement given by the Director-General of Statistics to the Government of India in his "Review of the Trade of India for 1894-95" in connection with the decline of the trans frontier trade, that a representation to the Government of India would not be of much practical benefit, at any rate with regard to the transit trade which appeared to have been practically destroyed by Russian policy and fiscal arrangements. It had been decided, however, as a preliminary step to address Mr. J. E. O'Conor, C.I.E., Director-General of Statistics, asking him for particulars of the duties and charges levied by the Amir on different classes of goods imported into Afghanistan from India, and on receipt of this information the Committee would then decide what further action should be taken.

Tea-culture in Russia.—Reports from Batoum, on the Black Sea, state that on March 15th a large number of Japanese labourers arrived there with 300 cases of young tea-plants and 200 cases of other Japanese plants. They proceeded to the Government lands at Tchavka, near Batoum, where experiments in the cultivation of tea and other economic products are to be started.—*Chemist and Druggist*, June 6.

NOTHING LIKE RUBBER.

We recently referred to the approaching scarcity of indiarubber, in view of the increasing demand for the article, particularly by the cycle and kindred industries; and we opined that a fortune awaited the man who would invent a substitute for rubber. Whereupon it was pointed out by a correspondent that there is already one substitute on the market, under the title of New Rubber. Since then a rubber trade expert has been talking to us. While admitting the use of the substitute referred to, he maintains that there is nothing like rubber. In other words, the substitute may be used as an admixture, and, indeed, commonly is, to the proportion of, perhaps, twenty-five per cent in, for instance, waterproofing and similar processes; but it is, by itself, of too greasy a nature, and lacks the requisite consistency, to serve for vehicle tyres, and the like. However, as an admixture, and as an adjunct to the ordinary indiarubber of commerce, the expert admitted that the substitute was valuable. And he went on to dilate upon the growing demands upon the present supply of indiarubber, especially when vulcanized. Not only are combs, pipe stems, and numerous other articles being made, in increasing quantities, from rubber which has been vulcanized —or, so to speak, annealed—but even nuts and bolts. The latter are being found particularly useful for rivetting drain pipes and similar work, as, unlike iron, vulcanized rubber will not corrode. And as to the proximate supply of indiarubber. Well, the expert admitted that there was a danger of demand exceeding production. No doubt there were immense forests of rubber trees, but then thousands of the latter had been destroyed by immature tapping through the cupidity of natives and traders. But would not systematic planting of new trees retrieve the position? "Ah!" responded the rubber man, "if we could only get people to be so philanthropic as to have an eye for posterity. Why, it takes a century to bring a caoutchouc, or 'syringe' tree, to maturity!" So it would seem that if the supply is to keep pace with the growing demand for indiarubber, more attention must be given to the opening up of new forests, while all immature tapping of trees must be tabooed.—*Pall Mall Gazette.*

TEA PLUCKING MACHINES.

Though much may be anticipated from the opening of the Assam Railway, in the way of reducing rates of labor by promoting free immigration, there is no doubt that planters must look to improved machinery in the future as the mainstay of the enterprise. Certainly, when glancing back at the history of the industry there is much cause for congratulation, but still it must be considered that substitution of steam, or other motor in lieu of hand power, has not been sufficiently attained nor will be until some means are devised of substituting mechanical contrivances for leaf plucking. There has, we think, been ample time for one or other of the three inventions, spoken of so highly last year, for their merits to have been submitted to the public, but for months past we have heard nothing of them. If either has been successful there is no necessity for the designers to hide their light under a bushel while, at the same time, no ultimate good can be derived from concealing the fact of failure. The man who can place on the market a really effective machine for gathering leaf is certain of a competency, if not fortune, and the different tea concerns, both private and companies, might be canvassed on the subject of subscribing to a handsome reward for the successful inventor. We do not assume that first efforts will be successful, for every day witnesses some improvements in all mechanics, but even could a reaper be made that would do half the work, a great step would be gained in economising labor in what is now the most expensive branch of manufacture. While confessing ourselves unable to offer any practical suggestion in adopting plucking machinery for use on unterraced teelahs, we think that on the gentle undulation afforded by terracing and on bheel gardens, the

solution of the problem lies more in the careful training of the bushes in pruning so as to ensure as far as possible a uniform surface, but to arrive at this desideratum would entail the employment of trained intelligent men, and garden coolies can hardly be said to come under such a denomination. However, once a tolerably level surface was obtained, it seems to us that a modification of the common grain reaper could be brought into play, and though a good deal of course leaf would be cut off, for the fine shoots would most probably bend before and slip through the teeth of the, reaper rendering it necessary to cut low down to the more rigid stem, sifting, after a few minutes rolling would remove tho greater portion of this. The difficulty lies in dealing with the sides and centres of the bush for table pruning (as it used to be called) has its drawbacks which increase as the season progresses, and by tho end of July or thereabouts-it would probably be found necessary to resort to the knife to thin out interlacing stems. The nut no doubt is a hard one to crack, and as few planters have time, or possess the necessary aptitude for experimenting with intricate mechanics, it would be better to offer the reward we suggest, taking care that our requirements are brought to the notice of machinists in all civilised countries. Though not without hopes that India or Ceylon may secure the honor of introducing an efficient plucker, it is more than probable that America or some of our semi-tropical colonies may be first in the field with one, for though tea-planting is now being attempted in various parts of the world, the high rates ruling for labor outside India, preclude the possibility of successful competition with us; unless the cost of out-turn can be brought down to our standard. This can only be accomplished by tho aid of machinery and necessity being the mother of invention, the ingenuity of tho colonists will compel them to pay the closest attention to the subject. This was the case in America some sixty years since, the paucity and consequent high prico of hand labor eventually giving us all those admirable inventions that have tended so greatly to lessen the cost of production of tho necessaries and luxuries of life. It would matter but little to the Indian planter whence the machine came, for he would eventually obtain it, and as there must still remain the necessity for employment of hand labor to a considerable extent on all tea-plantations, we should still remain masters of the position on account of cheap labor. It is certainly too Utopian to reckon upon dispensing with the coolie altogether.—*Indian Planters' Gazette*, June 20.

THE UNITED PLANTERS' COMPANY OF CEYLON, LIMITED.

The Directors now present to the Shareholders their Fifth Annual Report, with the accompanying Accounts to the 31st December, 1895, and are glad to be able to show continued satisfactory progress, the yield again showing a slight increase and prices having been well maintained.

During the year 163 acres of land have been planted in Tea, and are reported upon satisfactorily.

The accounts now presented show a Balance of profit of £7,670 0s. 10d., after paying an interim dividend at the rate of 5 per cent per annum, all current expenses and upkeep of machinery and buildings, and after writing £2,000 off the Factories and Machinery account, £1,500 off the new clearings account, and making further provision for the Superintendents' fund.

The Directors now propose to add £2,000 to Reserve Account, bringing the amount of that account up to £7,000, to pay a final dividend of 3½ per cent, free of income tax, making, 6 per cent for the year, and to carry forward a balance of £791 0s. 10d.

The Directors have again to express their satisfaction with the hearty co-operation received from the Superintendents in the management of the estates.

DRUG REPORT.

(From the *Chemist and Druggist.*)

London, June 11.

CINCHONA.—The monthly cinchona auctions were held on Tuesday, when a fair quantity of bark was offered. A moderately animated tone prevailed throughout the sale, and, with scarcely an exception, the bulk offered was sold at firm rates, higher prices in some instances being paid for Druggists' varieties, notably West African bark. The unit average ⅝d per lb.

The eight catalogues comprised 2,411 packages, which were divided as follows:—

	Packages.		Packages.	
East Indian cinchona	1,465	of which	1,358	were sold
Ceylon cinchona	532	,,	510	,,
African cinchona	212	,,	212	,,
South American cinchona	7	,,	7	,,
Java cinchona	195	,,	195	,,
	2,411	,,	2,282	,,

The following figures represent the approximate quantities of bark purchased by the principal buyers:—

	Lbs.
Agents for the Auerbach factory	123,784
Agents for the Brunswick Quinine-works	116,706
Agents for the Mannheim and Amsterdam works	111,075
Agents for the Frankfort and Stuttgart works	49,397
Agents for the American and Italian works	36,255
Messrs. Howards & Sons	33,465
Agents for the Paris works	22,730
Agents for the Imperial Quinine Company	4,800
Various buyers - -	42,437
Total quantity sold -	540,649
Bought in or withdrawn -	28,140
Total quantity of bark offered	568,789

Ceylon and East Indian barks realised, according to quality, from 1d to 3½d per lb. for Ledger, 1½d to 3½d for Officinalis, ¾d to 2d for Hybrids, and 1d to 2¾d for Succirubra. For Java Ledger 2¼d to 2¾d was paid, and for Hybrid from 4½ to 4¾d per lb. African succirubra quills realised 2d to 3d per lb. At today's drug-sales 20 serons of Guayaquil Loxa sold readily at from 7½d to 10d per lb. for fair, partly bright, partly broken, mossy quill, and from 4d down to 1d for ordinary dull quality. Of 131 packages cultivated Bolivian-Calisaya 61, in quill, fair, but damaged, realised from 2¼d to 3d per lb. Three packages South American red bark were bought in at 3s 6d per lb. The exports of cinchona from Puerto Cabello (Venezuela) in 1895 were 14,005 kilos. In 1894 they were 2,265 kilos.

CROTON-SEED is again dearer, and imports of good quality would no doubt realise high rates. At auction 8 packages (about 7 cwt.) of rather dark mixed Ceylon seed brought 66s per cwt. The last price paid at auction on May 2nd for a better-looking parcel was 65s.

KINO.—A new shipment of about 300 lb. of East African kino, upon which we have recently commented has been received. No definite price is stated, but it is said that the holders are not disposed to sacrifice it. The offerings of auction included 2 packages of dark astringent East Indian gum, one of which was bought in at 10s per lb., and three packages of a bright red and woody mixed gum from Bombay, for which no price was mentioned.

KOLA-NUTS are being pressed for sale owing to heavy arrivals. Fair bright West African are offering privately at 3¾d to 4d per lb. while for fresh kolas very low figures are mentioned. At auction 29 bags of dried nuts were bought in at 6½d to 9d per lb., and 20 baskets of fresh at 6d per lb.

VANILLA.—At today's auctions the demand was only moderate, and holders accepted a general decline of 1s to 2s per lb. Fine Mauritius, slightly crystallised, 6 to 8½ inches, realised from 28s to 33s; fresh plump, 4½ to 8 inches, 21s 6d to 27s 6d; 8 to 8½ inches, 31s; ordinary pale to common from 18s 6d to 8s 6d per lb. Good Fiji vanilla realised 1 s per lb.

VARIOUS DRUGS.—Good qualities of Cuttle-fish bone are scarce, and are firmly held. At auction 19 packages of low to ordinary dark mixed quality from Bombay sold readily at ½d to 2½d per lb. Twenty-seven bales Coca leaves, Huanoco character were bought in at from 1s 2d to 1s 3d per lb., and 20 bags Cocculus Indicus at 8s per lb. Five cases dark-brown Patchouly leaves from Penang sold at [illegible] per lb.

ANNATTO.—Good bright seed is now in very large supply, but difficult of sale. About 60 packages East Indian were offered today, but only 8 sold, at 5d per lb. for fine bright, and 1¾d for ordinary damaged. A parcel of West Indian annatto-paste, imported via New York, was also offered. It consisted of 10 cases, and was bought in at 2s per lb.

THE CEYLON ESTATES INVESTMENT ASSOCIATION, LIMITED.

REPORT

to the twelfth Ordinary General Meeting, held in Glasgow on the 16th June:—

The Directors have pleasure in submitting herewith the accounts for the year ending 31st March, 1896.

The Directors are pleased to be ablo to again show a satisfactory result of the year's working.

The balance at the credit of Profit and Loss account, including £481 18s 10d brought forward from last year, is £4,708 11 10

The Directors propose that this should be applied.—In payment of a dividend of 12½ per cent free of Income Tax	£3,875 0 0	
In writing down Tea Machinery and Factories	300 0 0	
		4,175 0 0
and that the balance of		£533 11 10

be carried forward to next year.

The directors who retire at this time in conformity with the Articles of Association are Mr. Robert King and the Reverend Peter Grant, D.D. They are eligible and offer themselves for re-election.

The Auditor, Mr. Alexander Moore, C.A., also retires, but is eligible to be re-appointed.

INDIAN PATENTS.

Specification of the undermentioned inventions have been filed under the provisions of Act V. of 1888.

IMPROVEMENTS IN OR CONNECTED WITH WEBS, TRAYS FLAPS OR CARRIERS FOR CARRYING TEA LEAF IN DRYING MACHINES.—No. 113 of 1896.—William Jackson, engineer of Thorogrove, Mannofield, Aberdeen, North Britain, for improvements in or connected with webs, trays, flaps or carriers for carrying tealeaf or other substances in drying machines. (Filed 8th June 1896.) —*Eastern Engineer*, June 27.

COCONUT OIL.

BY DR. HIRSCH.

There appears to be a good deal of irregularity in the classification of the various qualities of this important raw material for the manufacture of toilet soaps, and it would perhaps be better to replace the names at present in general use, viz., Cochin, Ceylon and coprah oil, by the terms "white," "prime," and "yellow, since "coprah" only means the material from which the oil is obtained, and the others (which may be called territorial designations) are somewhat misleading, it being possible to obtain "Ceylon" oil of first-class quality, or "Cochin" oil that is merely "prime."

Tho white or first-quality oil is used in the manufacture of white soaps, and must, equally with the latter, contain no coloring matter—a prohibition which particularly applies to gray, yellow or blue shades. The very soft bloom of the fine almond soaps is due to the complete emulsion produced by the incorporation of the oil with the colorless soda lye. For this reason the coconut oil should contain no free fatty acids, or, at any rate, not more than 1 per cent at the outside. The oil should exhibit the characteristic pure nutty taste and odor of its class.

For colored soaps, either filled or unfilled, the "prime" oil is used, a small proportion of coloring matter being therefore allowable in the oil and in "white" soaps made therefrom, but this should be very slight as compared with that contained in "colored" soaps. As a rule, the soaps from this grade are not required to exhibit the same bloom and transparency as the almond soaps. The presence of over 4 per cent. of free fatty acids produces lumpiness when the oil and lye are stirred up together, on account of the extra rapid reaction of the free acid with the alkali, and the mass easily becomes thick, the finished soap showing flakes due to the irregular distribution of the fat, alkali, color or scent. When filled soaps are in question the free fatty acids should not exceed 3 per cent., or the work will be attended with difficulty. In odour the oil is not expected to be so fine as the "white" quality, but must on no account be disagreeablo or irritating.

The chief use of the yellow oil is in the manufacture of filled soaps by the warm process, especially those yielding upward of 250 per cent. Its color may be deep compared with the finer qualities, but not to such an extent as to discolor the soaps. Free fatty acids are no detriment, good results being often obtained where as much as 12 or 14 per cent. is present The odor may be slightly rancid, but not so as to make the soap disagreeable.

The barrels for packing coconut oils must be perfectly clean, those having previously contained fusel oil or inferior spirits requiring to be steamed until the characteristic smell has disappeared. On account of the solubility of palm oil in coconut oil, and the consequent coloration thereby imparted to the latter and the soaps prepared from it, every trace of the palm oil should be removed from barrels having previously served to contain the same, before they can be used for coconut oil. Tar barrels must on no account be used, and the cleaning of casks by burning out is to be deprecated (unless all carbonized spots therein are subsequently scraped clean) on account of the contamination of the oil by particles of carbon, which ultimately make the soap look gray.

The estimation of the free fatty acids may be effected in the following manner: One hundred c.c. of pure alcohol (95 to 96 per cent.) are placed in a 250 c.c. flask, and a few drops of alcoholic phenolphthalein solution added thereto. To this mixture normal soda lye is added, one drop at a time, until a decided rose coloration is produced, a little more than one drop being needed to neutralize the carbon dioxide absorbed from the air by the alcohol. The liquid is then heated to a boiling, and ten c.c. of melted coconut oil are added from a pipette (which must be rinsed out afterward with alcohol twice). The oil dissolves completely (or nearly so), and may be titrated with normal soda until the initial rose-coloration reappears. One c.c. of the soda corresponds to 2·2 per cent. of free fatty acid.

There is another grade of coconut oil known as "imported" oil, which is said to be superior to the "white" quality, but the author has not had any opportunity of testing it. As with other imported oils, the buyer is supposed to accept what is tendered, without any guarantee as to color, purity or any other characteristic, and the weight is reckoned on the basis of 11 per cent. tare—which, however, is usually a few points higher.—Der Seifenfabrikant.—*Oil Paint and Drug Reporter*, June 8.

A POISONOUS ORCHID.—A comparatively common orchid, the *Cypripedium spectabile*, one of the oldest of cultivated species, has been discovered by Mr. D. E. MacDougal, according to the *Revue Scientifique*, to possess decided poisonous properties. "These properties," says the *Revue*, "are localised in the leaves and stems; they manifest themselves by a special cutaneous irritation in those who are so imprudent as to handle the orchid in question. This irritation recalls that which appears in persons who have handled *Rhus* [poison ivy]. The substance that causes the effects consists of an oily matter secreted by the glandular hairs. This matter is found, as in the Chinese primrose, deposited between the cellular wall and the cuticle of the terminal cellule of the hair; it is set free by the rupture of the cuticle. This poisonous substance seems to perform the function of protecting the reproductive portion of the plant, for the virulence of the poison and the quantity secreted increase as the plant develops and attains a maximum during the formation of the seeds."

TEA PLANTING IN DARJEELING.

(*Continued from page 100.*)

DISCUSSION.

The Chairman said they had heard about as good a paper as could possibly be given on this important subject, a paper abounding not only in very accurate description and practical knowledge, but also illustrated in a very elaborate manner. The important part of the address—apart from the labour question—lay, not so much in the preparation of the ground for the tea plants as in the preparation of the tea. Of course, all that had been said as to forests, buildings, and the like, was very interesting, but that one could imagine; and, no doubt, in these respects their rivals in China could show quite as good a case as India. He ventured to suggest to the British public that the real hope was in the preparation of the tea. In that respect they had the advantage, and that was the reason why they were rapidly gaining ground over China. Many could, no doubt, remember when the tea industry in India was in a very low state; but now, owing to the adoption of scientific processes, that condition of things had been considerably altered. It was the possession of superior machinery which had given India the advantage over China. He should be glad to know the exact number of acres under cultivation in the Darjeeling district, and what quantity was still available for the purpose. It had been said that tea planting was almost the only industry in Darjeeling; but he could recollect the time when the cultivation of cinchona was an important industry

Sir Steuart Colvin Bayley, K.C.S.I., thought they owed a debt of gratitude to Mr. Christison for his very interesting and instructive paper. The paper dealt with the tea-planting industry, as a whole, in Darjeeling, and there was much in it, particularly in the technical portions, as to which tea planters whose experience had been in other provinces would have something to say. He had hoped to hear from the reader of the paper a little more upon the subject of labour—for instance, tea method of recruitment, the average duration of contract—that was to say, whether the labourers who come from a distance stayed any time in one garden; whether they took an annual holiday to vist their homes; or whether they stayed there for years? No one could have told us better about the Nepali labourer than Mr. Christison, for no one knew them better or did more for them. Perhaps there were many who had attended the annual gathering at Tukvar, which was organised by Mr. Christison, and to which many coloured crowds of cheerful, well-looking labourers from all the neighbouring gardens used to flock for the contest in athletic games and other amusements promoted by their guide, philosopher, and friend, Mr. Christison. The Nepalese labourer had probably more intelligence and industry than those of any other part of India; and among the advantages which the Darjeeling tea planters had over their neighbours in Assam—and there were many—was the fact that they drew their labourers from the neighbouring country. There was a grievance even in regard to those labourers—that they were taken away from the work in the tea gardens and recruited for military police in other parts of India. This question was just beginning to crop up when he was in India. He fancied it had become more burning; but as he knew nothing of its recent developments, he would leave others to say what there was to be said about it. His advice to the Darjeeling tea planters would be that, whatever pressure they might put upon the Government to get their grievances redressed, they should not fall into the snare of asking for a labour law. If they did, they would no doubt find their labour protected against Government or other competition, but they would find the price which they would have to pay a very heavy one. The great advantage which the Darjeeling and the Dooars gardens enjoyed over their Eastern rivals was the fact that they had no labour law. In Assam there was no indigenous labour to speak of, in Upper Assam none at all. If the tea industry was to live labourers had to be imported at very great expense from Bengal. But having gone to this expense the planters required, in the fierce competition that existed, to be protected from desertion and from the allurements of other employers of labour. Hence the contracts were maintained by severe communal penalties, but if the law did this on one side it did a great deal also on the other. It took under its protection the general well-being of the labourer, his wages, his food, his clothing, his housing, his sanitary arrangements, his medical attendance, &c. These were looked after by means of inspection and minute regulation, two methods which inevitable as they were for the purpose, tended no less inevitably to a considerable amount of friction. A worse result was that the labourer when thus hedged in was such a valuable asset that the planter was willing to give a very large price in Upper Assam, over a hundred rupees for each. But the difference between this sum and the actual cost of conveying the labourers to the district was so great as to leave a very large margin, and inevitably there was a fierce struggle set up for this margin. "Where the carcase is there are the eagles gathered together," a whole horde of middlemen, contractors and their agents, licensed recruiters, unlicened recruiters, garden sirdars, and what not, all connected for the *corpus vile* which was to yield this profit, and systematic recourse to fraudulent recruiting and even to kidnapping, become common, sufficiently common to be felt as a discredit to the administration, and one not easily to be put down. This point had received very great attention from his successor (Sir Charles Elliott); and one of the last of his public acts had been to appoint a committee, which, representing all interests, would try to regulate and co-ordinate the various conflicting and antagonistic systems by which labour for the eastern gardens was collected, recruited, and sent up. Any arrangement by which these conflicting and ill-regulated interest could be brought into a decent system, under responsible management, so that they would work not antagonistically, but for the benefit of the tea planters, would be an advantage not only to the planter but to the labourer and to the public. He should be glad to hear about the genesis of the committee and what its results were likely to be.

Sir Charles Elliott, K.C.S.I., said the information given by the reader of the paper was not only interesting to those present, but would add a good deal to the interest taken throughout England by those who were concerned in the tea industry—not only with regard to the cultivation of the land and the preparation of the tea, but in the very important question of the way in which the tea was treated when it came to London. In reply to the Chairman's inquiry as to how far the extension of the Darjeeling district was possible for tea cultivation, he might say that there was not much more room for extension. Almost all the land capable of being planted with tea had been taken up. The only extention possible, with a few exceptions, especially in the Daling district, where the area reserved for tea had not all been taken up, was the gradual slow extension which went on from year to year within the areas of the different plantations whenever labour was available for clearing and planting an additional 25 or 50 acres. But there was an enormous area capable of tea cultivation in the Dooars. The land in that district was much more suitable for tea cultivation, as it produced a vastly larger crop, the result being that the influx of capital necessarily went into the Dooars instead of into the Darjeeling district. The Chairman had also referred to cinchona, and he might say that the Government plantation near Darjeeling was the source of the quinine supply from Upper India, but the price of bark had fallen so low that the cultivation of cinchona had been abandoned in all the gardens. He wished to express his strong agreement in what had been said by Mr. Christison as to the relations between the tea planters and the population of the district, and the great utility the tea planters were in the administration of the country.

He, as well as his predecessors, had always set a high value on the assistance given by the tea planters to the administration in various forms. They were the backbone of the British Government in that district; and were the chief members of the District Board, corresponding to the county councils in England, through whom were carried out the making and repairs of roads, the establishment of schools, the improvement of sanitation—in fact, every description of work. The question of labour was a difficult one in Darjeeling, though it was not nearly so difficult there as in other parts of India. Reference had been made in the paper to the depletion of tea gardens through competition by the Government in recruiting labour for military purposes in Burmah and Bengal. This recruiting had been complained of by the tea planters as drawing upon their supply of labour. But the Government had taken the greatest possible pains to prevent any such grievance arising. A transport officer had been appointed at Darjeeling with a depot there, and he had strict injunctions to see that none of the recruiters went to the tea gardens or took anyone employed there. The recruits were kept at the depot for some considerable time; so that any planter who had suspicion that his labourers had been carried off might go to the depot and see the recruits, and in case he identified any of his coolies the authorities would not retain them. He had heard the same story about the want of male labourers on some of the gardens, but well-managed gardens in a favourable situation did not suffer in this way. The two Tukvar gardens, including the one over which Mr. Christison presided, were instances of what could be done by good management. They did not recruit labour; they bred more labour than they could employ. The labourers lived upon these estates permanently; children grew up there and multiplied to such an extent that one of the chief difficulties was to find employment in the gardens for the children bred on the estates. In other gardens which were not so near civilisation, and perhaps not so well managed, the difficulty of finding labour was no doubt greater. The grievance was not, as might be supposed, that Government recruited coolies employed upon the gardens, but that Government went into the same market as the tea planters, and employed men whom the planters might have employed. The immigration from Nepal referred to by Mr. Christison was employed in three different ways—part went on to the gardens as they were extended, the greatest part went on to the land, especially in independent Sikkim, where agricultural extension had been very large; and a small portion was recruited by the Government for military and transport service. All that could be done was to try and arrange that the competition should not be an unfair one. The Government required very severe work from the men it recruited for the military police and for transport work. They were sent long distances, and to unhealthy districts; on the other hand, they were seldom required for a long period, whereas tea planters employed them for life. As the men had to undergo great privations while in the employ of the Government they received a larger wage than they got from the tea planter, and do doubt to the more adventurous sprits a higher wage with a short period of service was more attractive in spite of the distance and risk to life. On the other hand, the wages earned on the tea gardens were certainly large, and thrifty and diligent families were able to save a considerable sum. His own belief was that all had been done which could be done to secure fairness in the tea planter's interest. He need not say that if any well-considered complaint were made, and some grievances established, there would be the greatest readiness on the part of the Government to listen to the complaint and to remove the grievance. With regard to the wider question, which had been touched on by Sir Steuart Bayley, he might mention that the Commission which had been sitting to discuss this particular question, and the remedy to be applied, had suggested that the work of recruiting labourers for tea gardens in Assam should be concentrated into a single hand. The great evil which had arisen with regard to the competition of labourers had arisen from the immense number of different persons who were competiting against each other—deceiving each other, stealing each others coolies, kidnapping women and children, or enticing them by false pretences, and even using force and wrongful confinement so that they constantly figured in the police courts. A great contrast was presented by colonial emigration, which was conducted by well-paid agents established in Calcutta, who recruit from 10,000 to 15,000 men and women every year for the colonies. These recruits were brought down to Calcutta and embarked at Calcutta at 15 rupees per head. An exactly similar class were brought down from the same parts of the country, and taken to Assam, but instead of costing 15 rupees they cost the tea planter 150 rupees. And the tea industry had to pay annually a fine of 50 lakhs of rupees on the 50,000 to 60,000 people who immigrate into Assam. This large sum, or most of it, went into the hands of the middlemen. The only remedy which could be suggested was to sweep the middleman away; and he trusted this would be the result of the commission that was now sitting to report upon the subject.

Mr. Shillington said that, having been a tea-taster in Mincing-lane for the last 30 years, he should like to refer to one point to which Mr. Christson had alluded, namely, that of bulking. It had been suggested that the dock companies did not act fairly in the matter. He wish to say that, although the treatment that tea received at the docks was rather rough, still it was a necessity that every parcel should be turned out and packed again. It was said the remedy was to bulk the tea at the gardens, but, unless they could have perfectly even quality, it was hopeless to rely on this. With regard to the question of tares, it had been said that in India they could not get wood which did not dry upon its way home. But the difficulty had been avoided in China, where they sawed their wood five years before it was wanted. The Indian tea industry was getting to be a large affair; and it was a terrible thing to tasters to have to deal with such a large number of samples. He recollected the time when one sample of Chinese tea would represent 600 chests; in India a sample represented an average of 28 chests, the consequence being that the tea tasters had to taste some 50,000 samples each year. He suggested that in future the number of packages in each break should be increased to 100 chests at least.

Mr. Ernest Tye said the paper was a most able one, and he had no doubt it would give great pleasure to many when it appeared in the columns of the *Journal*. The most important question referred to in the discussion was the labour question; but as this had been so exhaustively dealt with by previous speakers, there was little left for him to say. He hoped that upon some future occasion this question would be dealt with by itself in a paper.

Mr. George Williamson said he could not agree with everything that had been said upon the labour question. Great progress had been made in the cultivation of tea in India, as was apparent from the fact that an enormous quantity was now exported, while in 1848 (the year he entered the field) the export amounted to only 250,000 lbs. There were large areas still suitable for tea cultivation in India, but in his opinion the widening of the field of consumption was a more important factor in the problem of the future prosperity of the industry than increasing the area of production. He was very pleased to see Ceylon take the lead as an educational agency, but to his mind the Ceylon tea had not the grit or body of Indian tea.

Mr. John Ferguson said that they (in Ceylon) acknowledged that the Darjeeling district produced the very finest tea, and were curious to know what increase might be looked for in Northern or Southern India of finest teas. He thought the reader of the paper had not quite made clear whether the 10,000,000 lb. of tea now produced in Darjeeling from the 56,000 acres were all of the fine tea which sold at the highest price, and whether this acreage could be added to materially. Mr. Christi-

son had stated that the grants of land in private hands equalled 329 square miles, and be should like to know what further portion of this could be used for tea cultivation. In Ceylon, and in the Nilgiris, the area available for fine teas was limited.

Dr. J. A. Voelcker thought the gist of the paper was to be found in the concluding remarks. What they wanted to know was what had brought Indian tea to the front greatly to the exclusion of that from China? It had been suggested that this was in a great measure owing to the advance of knowledge of scientific processes and the use of improved machinery. This might be true with regard to machinery, but upon the other point he ventured to differ. His belief was that from beginning to end both the cultivation and the manufacture of tea were carried out more by "rule of thumb" than according to any scientific method. There appeared to be a want of thorough knowledge of what actually did take place in the different processes. He felt that the question for the future was not so much whether here or there one could produce a fine quality of tea, or whether the area of cultivation could be extended, but it was how large a number would in future be able to produce the finest quality and in a scientific manner. There appeared to be an absence of knowledge upon points of cultivation, for example, as to what manure should be used and what should be avoided in order to produce the best tea. With regard to the manufacture, though there might be excellent machinery, there was very little known of the processes which were denoted by the use of such chemical terms as "oxidation" and "fermentation." These terms were used in a loose way without any clear idea of what they meant. Until more was known on such points that progress would not be made which was necessary to keep English industries in India to the front. In Germany, the Government encouraged greatly the development of industries and the spread of knowledge concerning them, but little was done in this direction either in England or in India. Not very long ago a Tea Planters' Association in Assam decided to call in the aid of science to their industry, and engaged the services of a chemist from England. But he was only given a year and a half in which to find out all about tea cultivation and tea manufacture, and soon afterwards the association said they had no more funds, and his services were dispensed with. It was not in such a way at this that scientific investigation should be carried out, and what was really needed was a patient working out of all the details, alike of cultivation and of manufacture, until the whole was put upon a thoroughly scientific and practical basis.

Mr. Christison, in reply, said he could not contribute much to the vital question of labour for Assam, but he fully appreciated Sir Steuart Bayley's advice to those districts which had no labour Act to do without one. He frankly acknowledged, and felt thankful for it, that her labour advantages were among the strong points in favour of the Darjeeling district, and though the grievance referred to did exist, they really had no labour question to compare with that of Assam. Upon that wide and perplexing subject he would not venture. If, however, he might be permitted one remark, it would be, let Assam concerns recruit through a common agency, and avoid undue competition with each other; and he would implore all districts to believe that what was for the common weal in this matter was for the best interests of individual concerns in the long run. Therefore, let all pay their coolies fairly, but at stated accepted rates with other conditions for their locality, and avoid stealing a march upon each other, or entertaining, much less enticing away, a neighbour's labour under any temptation or pretence whatever. The question of Darjeeling labour he considered of too local a nature to be dealt with more fully than it had been in his paper. Still, it was a wide and very intricate, as well as a most important, question, sufficiently studied by but few, and would alone require a series of papers to deal with it in all its phases. There were some Nepalis who had been employed for 20 and 30 years in the gardens with which he was long connected. Many lived and died upon the tea gardens, but they were not a long-lived people more than Europeans on Darjeeling gardens, he grieved to say. Though, as he had said, coolies were not really under contracts to the gardens, and were free to leave at least at the close of any season, the majority—especially women—settled down for years. There was a considerable proportion—greater or less on different gardens—more or less shifting, who came in from Nepal (a few also from Sikkim and the Government farms) and returned thither in a year or two, or were induced within shorter time to leave—and these were chiefly men—for Government service as stated, contract work, and a few from the hills (more from the Terai) for the Dooars and even more remote tea distrtcts. It was not unusual for coolies, but more particularly headmen, to take leave to visit Nepal, returning to their duties on the gardens, and many visited their homes to recruit coolies at the same time. He hoped Sir Charles Elliott would pardon his differing from him in regard to some minor details. He was the more reluctant to do so knowing Sir Charles Elliott's great ability, and that there never was a more conscientious and painstaking Governor, or one more desirous to be fair to every industry and enterprise. He had said, with reference to Darjeeling, that Government recruited in the same market as the tea planter did, but he (Mr. Christison) begged most respectfully to submit that that was just what was not done. The planter recruited his labour, at some expense and risk, from Nepal; Government within the districts in the bazaars and markets frequented by the garden coolies. He had suggested that Government ought to recruit for the military police and expeditions direct from Nepal, as was done now for the Goorkha Regiments, as he presumed under treaty with that State, or, failing that, elsewhere in India, or from the vast native Government colonies within the district. He was fully satisfied of the anxiety of the Lieutenant-Governors and the districts officials not to take garden labour, and to return any that had been taken; but it was difficult for them to obtain accurate Information on all points, and recruiters, and especially petty recruiters, had their own reputation for zeal to maintain. He could give many instances of how the well-intentioned rules for the return of coolies were frustrated, by coolies being returned at the depôt at Darjeeling, merely to rejoin the recruits a station or two down the railway line and the like, only fully understood by those possessing a perfect knowledge of these adventurous hill-tribes. The experience of the two concerns mentioned by Sir Charles Elliott really proved the depletion of men referred to. In one instance the proportion of men fell from 42·6 per cent. to 17½ per cent., and in the other so straightened was the Tukvar Co. for men coolies, that it was actually forced to increase their wages by twenty per cent. He was in accord with the views expressed by Dr. Voelcker, as to there being as yet little known of the chemistry of tea manufacture. For instance, what was really known as to the action of light in withering? or the chemical changes that took place in the various stages of the so-called "oxidation" and other processes described? It was regrettable that Mr. Bamber's services were not continued. That gentleman displayed much industry, and no ordinary powers of observation, and accomplished a great deal in a short time. Mr. Bamber had only time to visit two out of the many Indian tea districts. Still, he made a valuable and most comprehensive contribution to the literature of tea, which, as far as he was aware, was the standard work on the chemistry of manufacture, if not of the entire subject at the present time. It was difficult often to get science and practice to go hand in hand. The Indian Tea Association, aided by Government, ought, as recommended by Dr. Voelcker, to employ a competent agriculturist as chemist to continue the investigations in conjunction with practical planters, and not for one or two years only, but for 20 years. In reply to Mr. Ferguson, the proportions of the Darjeeling tea crop from the hills was a little short of eight millions, and the majority of that

was of true Darjeeling flavour. As stated in his paper he (Mr. Christison) agreed with Sir Charles Elliott that Darjeeling might be looked upon as a closed district for tea, there being practically but little more land available. He had no hesitation in saying that the land allotted for tea grants in the Daling district was, taken all in all, the most precipitous and barren of any hill land he had seen. Of course in the district there was land of gentle slopes, which afforded scope for as much tea as was on the original hill district, and in this original hill district there was also much land suitable for tea likewise in the possession of the natives. Could this have been thrown open for tea it would have been applied for on account of the more healthy situation, even more eagerly than the Dooars, but it was not desirable nor would it be fair to grant land there for tea now that it had been settled upon natives, besides the land had been tortured, impoverished, and bared of forest, and would require to be allowed to lie fallow for many years before it would be suitable for growing tea. —*Journal of the Society of Arts.*

NOTES FROM THE METROPOLIS.

CRITICISM ON TEA COMPANIES

is not likely to stand in the way of new proposals. The big one of the week has been Sir John Muir's union of the North and South Sylhet with

THE CONSOLIDATED TEA AND LANDS COMPANY with a capital of £2,000,000. I quote from the prospectus as follows:—

THE CONSOLIDATED TEA AND LANDS CO., LTD.

Capital, £2.000,000, divided into 100,000 five per cent cumulative 1st preference shares of £10 each; 40,000 seven per cent cumulative 2nd preference shares of £10 each; 60,000 ordinary shares of £10 each.

Present Issue—100,000 five per cent cumulative 1st preference shares of £10 each; 40,000 seven per cent cumulative 2nd preference share of £10 each; 40,000 ordinary shares of £10 each.

DIRECTORS.

Sir John Muir, Bart., of Deanston, and of Messrs. James Finlay & Co., 22 West Nile Street, Glasgow, and 34 Leadenhall Street, London, and of Messrs. Finlay, Muir, & Co., Calcutta and Colombo.—Chairman.

Field-Marshal the Right Honourable Lord Roberts, of Kandahar and Waterford, G.C.B., G.C.S.I., G.C.I.E., V.C., D.C.L., LL.D., &c., Royal Hospital, Dublin.

Sir Robert Drummond Moncreiffe, Bart., of Moncreiffe, Bridge of Earn, Perthshire.

P. R. Buchanan, Esq., of Messrs. P. R. Buchanan & Co., 45 Leadenhall Street, London.

William Allan Coats, Esq., Director of Messrs. J. & P. Coats, Limited, Thread Manufacturers, Paisley.

A. B. Murray, Esq., 33 Renfield Street, Glasgow; and Rosebank, Patrick.

A. M. Brown, Esq., of Messrs, James Finlay & Co., 22 West Nile Street, Glasgow.

William Walker, Esq., of Messrs. James Finlay & Co., 22 West Nile Street, Glasgow.

Robert Scott, Esq., of Messrs. Morgan & Scott, 12 Paternoster Buildings, London.

This Company is formed to take over as going concerns, and to amalgamate, the estates in India and Ceylon particularized in the statement accompanying this prospectus, and known as The Estates of the North Sylhet Tea Company, Limited, The Estates of the South Sylhet Tea Company, Limited, in which are included the Estates of the North Travancore Land Planting and Agricultural Society, Limited.

These Companies have, since their formation in 1882, been worked under the same proprietary, as private Companies, and they are now amalgamated, and formed into a Public Company with a view of securing a quotation on the London and Glasgow Stock Exchanges.

The estates comprise an area estimated at 180,000 acres of land, situated in Assam, Sylhet, the Dooars, Darjeeling, the North Travancore Hills, and Ceylon, of which, on 30th November, 1895, there were planted 21,310 acres with tea in bearing, and 5,439 acres with young tea, coffee, cocoa, and coconuts. Since that date 1,371 acres have been cleared and are in course of planting, so that the whole area at present under cultivation is 31,120 acres.

As will be seen about 150,000 acres are still uncultivated. This land has been very carefully selected, and a large proportion of it is pronounced by the Superintendents and the Managers of the Companies to be as fine land for the cultivation of tea, coffee and cocoa as can be found in India and Ceylon. The large tract of land estimated to contain 90,000 acres in the North Travancore Hills, of which about 60,000 are computed to be at an elevation of 4,000 to 6,500 feet, is an exceptionally attractive feature. This land is generally very rich, and capable of yielding large crops of tea or coffee of the highest quality, and its acquisition renders the prospects of the Company unusually promising, as either by the formation of subsidiary companies, or by opening up the land on the Company's own account, large profits should be secured therefrom. It is the Directors' intention to put a considerable area under coffee, the cultivation of this product having proved successful and remunerative in Southern India. The unplanted lands in Ceylon about 8.000 acres, and in Assam about 11,000 acres, will be rapidly developed and brought under cultivation.

All the estates are well equipped in every respect, having a staff of 127 experienced managers and assistants, an excellent labour force of about 34,000 labourers, an ample supply of good machinery, fine roads and tramways, and substantial brick factories, bungalows, godowns, good wells, &c.

Compared with other good dividend-paying Indian Tea Companies the record of the North and South Sylhet Tea Companies, Limited, is one of the highest. From 1882 to 1886 inclusive, while the plants were young and yielding little or no leaf, no profits were made from the newly-planted gardens, but out of the profits of the seasons 1887 and 1888 the Companies paid to their Shareholders compound interest at the rate of 5 per cent. per annum, for the whole period of about five years, during which the estates were practically non-productive, besides placing £16,000 to reserve account for depreciation. For the past seven years—from 1889 to 1896—sufficient profits have been earned to pay an average dividend of 10 per cent. per annum on the capital paid up, and to put aside £24,000 to reserve account for depreciation.

The crop, which in 1888 was 5,678,379 lb., had increased in 1895 to 9,583,734 lb. of tea, The estimated crop for the current season is 10,070,000 lb. of tea, and the present planted area as it matures is expected to give an annual yield of 14,000,000 lb. of tea. This large increase of crop should reduce the average cost of production per pound.

Although a large area of the cultivated land was either too young to yield crop or only in partial bearing, the average profits for the last four years amounted £93,976, as will be seen from the Auditor's certificate set forth below, or sufficient to pay a dividend of 5 per cent. on the Cumulative 1st Preference Shares; 7 per cent. on the Cumulative 2nd Preference Shares in the new Company; and to leave a balance available for the payment of a substantial dividend on the amounts paid up on the Ordinary Shares. As the young estates come into bearing the amounts available for dividends on the Ordinary Shares should be materially increased.

The properties are taken over as from 30th November, 1895. The Vendors will receive interest at the rate of 5 per cent. per annum upon their purchase-money from that date until the same is paid. The accounts will be closed on 30th November in each year.

Messrs. Finlay, Muir, and Co., of Calcutta, who have managed the Estates since their formation, have agreed to continue to hold the Managing Agency in India and Ceylon, in which Island they have a branch firm, and they have undertaken; during their tenure of the Agency, to hold shares to the nominal value of £200,000 in the Company, which will include Ordinary Shares to the nominal value of at least £100,00.

Sir John Muir, the Chairman of both the Vendor Companies, has also agreed to act as Chairman of the Company for at least five years, and to give the Company his active support.

The cost price of the Estates in the books of the North and South Sylhet Tea Companies, Limited, on 30th November, 1895, was £1,446,342. The purchase price has been fixed by the Venders, who are the promoters of the Company, at £1,450,000 for the planted Estates, and £150,000 for the uncultivated land—in all, £1,600,000.

The Company will repay to the Vendors all advances made by them on account of the current season; and will also take over, at a price to be fixed between them, all stores purchased by the Vendors for future use and in hand, as at 30th November, 1895.

The balance of this issue, together with the £200,000 yet to be issued, will, it is intended, be expended (subject to the payment of the preliminary expenses) upon the development of the land and of the young Estates.

The legal expenses, brokerage, and other charges attending the issue of the Prospectus and allotment, will be paid by the Company.

SCHEDULE REFERRED TO IN THE ACCOMPANYING PROSPECTUS.

THE SYLHET ESTATES consist of the Deanston, Balisera, Rajghat, Amrail, Jagcherra, Goombira Dukiugole, Sagurnal. Holicherra-Degaicherra, Baitakhal, Lulleecherra, Lallakhal and Jaflong Divisions, comprising an area of 50,707 acres as follows:—

	Acres.
Tea in bearing	14,456
,, Non-bearing	916
Cleared and in course of Planting ..	315
Uncultivated	35,020
	50.707

THE ASSAM ESTATES consist of the Hattigor Powai, Sagmootea and Borpani Divisions, comprising an area of 11,059 acres, as follows:—

	Acres.
Tea in bearing	1,192
,, Non-bearing	771
Cleared and in course of Planting ..	975
Uncultivated	11,382
	14,320

THE DOOARS ESTATES consist of the Rungamuttee, Dum-Dim, Nakhati. Bytagool and Nowera Nuddy Divisions, having a total area of 10,899 acres as follows:—

	Acres.
Tea in bearing	4,542
,, Non-bearing	34
Cleared and in course of Planting ..	20
Unncultivated	6,303
	10,899

THE DARJEELING PROPERTIES consist of the Bloomfield and Orange Valley Estates, with an area of 1,007 acres as follows:—

	Acres.
Tea in bearing	650
Uucultivated	357
	1,007

THE CEYLON ESTATES consist of the Warwick, Gonakellie-Mandara-Newera, Hopewell, Meddekande, Halgolle-Weweltalawa, Halwatura, Delwita and Katugastota Divisions, and comprise 14,000 acres of land, as follows:—

	Acres.
Tea in bearing	470
,, Non-bearing	2,044
Cleared and in course of Planting ..	1,306
Coffee, Cocoa, and Coconuts non-bearing..	1,075
Cleared and in course of Planting ..	730
Uncultivated	8,375
	14,000

THE NORTH TRAVANCORE ESTATES AND LAND consist of an estimated area of about 90,000 acres as follows:—

	Acres.
Tea in bearing	Nil.
,, Non-bearing	405
Cleared and in course of Planting ..	1,000
Coffee Non-bearing	194
Cleared and in course of Planting ..	25
Uncultivated	88,376
	90,000

About 99,555 acres of land are freehold, subject, in the case of the North Travancore Property, to a small tax, and estimated area of 74,539, acres are held under ordinary Government Leases, and the balance 6,839 acres is private leasehold land.

Although the areas and other particulars above mentioned are believed to be correct, or approximately correct, the Vendors are not to be held as guaranteeing their correctness.

Glasgow, June 1896.

I hear that apart from the fact of the old shareholders taking the greater part, there is likely to be no hesitation in the part of the general public in offering for more than is available.

The same is likely to be true of Mr. C. E. Strachan's Company—

'THE GALLAHA CEYLON TEA ESTATES AND AGENCY COMPANY LIMITED'

—which is likely to come out very shortly with a capital of £165,000, and all that may be offered to the public are likely to be applied for several times over. The Company are to have 2,397 acres of tea including what is planted this year, 107 acres cardamoms, 276 acres planted for fuel, 2,094 acres forest, patana, etc. After paying working expenses, interest on Debentures and Preference shares, it is estimated there ought to be 7½ rising to 10 per cent for the ordinary shareholders,—perhaps more as there will be 762 acres young tea coming on. Such, I believe, are some of the anticipations.

SHARES OF EXISTING COMPANIES.

Notwithstanding the eagerness about such new Companies as the above, there can be no doubt of some slackness in respect of the shares of existing Companies, mainly due to the large number of shares offering from Ceylon, showing that caution must be used in the Colony with reference to locking up capital. Nevertheless, there is great confidence felt in Ceylon and its tea enterprise—a recent visitor speaks of all "as in a most flourishing and prosperous condition and men were commencing to talk of £130 an acre as the value of good tea."

This, I submit, is too sanguine, and it can scarcely be wise to go above the price recently paid in Dimbula and its neighbourhood.

THE RAGALLA TEA ESTATES, LIMITED,

is to declare an *ad interim* dividend on 1st July of 4 per cent.

NOTES FROM OUR LONDON LETTERS.

(*From Our Own Correspondent.*)

LONDON, June 19.

The last letter sent you gave copies of correspondence dealing with the proposed re-construction of the capital of the

ORIENTAL ESTATES COMPANY.

We were not then in possession of information enabling us to offer any comment upon the subject of these letters, but the Chairman's speech at an extraordinary general meeting of the Oriental Estates Company held this week enables us now to do this. The object of this

meeting was to consider resolutions for re-arranging the capital account with the view of bringing it into close correspondence with the present value of the assets. Mr. Quintin Hogg presided on the occasion of this meeting. He said he thought some scheme of re-construction would be desirable, because, if the assets were not sufficient to meet the liabilities they must either reduce the value at which those assets stood in the Company's books or accumulate a cash reserve to balance the deficiency and as a set-off against depreciation on the estates. He preferred, he said, a live and negotiable security in place of the present preference shares. In fact the ordinary shareholders could prevent any money being paid to the preference shareholders as long as their assets did not represent the value at which they stood in the books. He estimated the annual income from their estates at £20,000. If the meeting adopted the scheme proposed, £10,000 of this would be taken for debenture interest, and £5,000 would be required for the payment on new preference shares. Of the balance, £2,500 would go to reserve, and of the other £2,500 one-third would go to the preference and two-thirds to the ordinary shareholders. The board were inclined to favour this scheme as a fair basis of negotiation, and they were in duty bound to submit it to the shareholders. Mr. Welton, the official liquidator of the late New Oriental Bank, and in that capacity, of course, largely concerned with this proposal condemned the scheme as so unfair that he did not believe any judge would sanction it if it were opposed. Some of the shareholders moved and seconded the appointment of a committee to investigate the affairs of the Company and to protect the interest of the preference shareholders. Mr. Slaughter, who had framed the proposal remarked as to this that he and his friends held 60,000 preference shares, and it was their object to increase the value of these. Another shareholder stated that at present their ordinary shares represented no value and were held by a syndicate. The idea at the back of the scheme, he said, was to increase the value of these. The final course adopted was the appointment of four gentlemen to confer with the directors on the scheme, to negotiate with the ordinary shareholders, and report to a subsequent meeting. To us outsiders the condition of things existing with respect to this company is exceedingly difficult of comprehension. If things be as stated, the position of the company is not favourable, and one is inclined to wonder how it was that the late large sale of the company's debentures resulted so well. And if thi sale was made with the facts mentioned kept back from the public, that transaction should seem to have been made under false pretences. Surely the public would not have purchased these debentures had it been aware, for instance, that the valuation of the assets in the company's books was a fictitious value! That is the first point that must strike the uninitiated. Then why should Mr. Welton have so strongly condemned the proposal to right this difference? It seem to us that the ordinary shareholders may be threatening to refuse payment of the interest on the preference shares on the ground that that difference exists. If so, those who lately purchased debentures ought to have a voice in the matter But we don't pretend to wholly understand either the scheme propounded or the intentions or desires of those who oppose it. Only one thing seems certain, and that is that no appeal should be made to public investors so long as the value of the assets in the books is not correspondent with their *actual* value. It is to be feared that the position is not a satisfactory one, and that the revelations made at this meeting may act injuriously on the credit of Ceylon tea companies generally. For the general public will be no more able to discriminate as to the bearing those revelations have than we are ourselves able to do.

MEXICO AS AN OIL PRODUCING COUNTRY.

According to the last available statistics, Mexico produced the following quantities and values of oil seeds in 1894:

		Hectoliters.	Value.
Sesamum	..	17,263	$37,000
Earthnut	..	70,510	110,000
Chia	..	721	5,500
Coquito	..	9,862	26,500
Cocoanut	..	346,500	1,165,000
Castor	..	18,740	22,000
Linseed	..	15,578	45,000
Rapeseed	..	77,711	132,500

The Indian sesamum, called in Spanish ajonjoli or aljonjoli, is sown in February or March, and is reaped in April or May, and in Mexico it yields 500 per cent. Notwithstanding this, and although there is no lack of proper soil for it, the amount grown is comparatively small. This is owing to the want of field labour and the small local demand. The difficulty of transportation to tho seaboard has caused the idea of shipping it to be abandoned, although it would find a ready market in Europe. In the producing districts it can be bought at from $2.75 to $3.50 tho charge of 138 kilos, but the heavy cost of mule transport to the nearest railway station, and the fact that the market is cornered, makes the price at Mexico City about $8.50 for the same quantity. The sesamum is treated nowadays by hot processes, and yields 45 per cent its weight of oil, and the oil cake is a good food for cows in milk. The sesamum oil, with a liberal admixture of olive oil, produced in the environs of the city, is used almost exclusively for alimentary purposes. The mixture is called aceite de comer (eating oil), and sells retail at about a shilling the liter. Under the names of rose oil and green oil it is also used in pharmacy to colour ointments and in making the empirical medicines of the country.

Rapeseed grows on the central plateau, and costs in Mexico City from $4 to $5 the charge. It yields about 35 to 40 per cent of its oil, and many oil manufacturers in the country use the oilcakes as fuel foe their engines.

Flax up to now has hardly been cultivated in Mexico for the sake of the seed, although many trials have been made to grow it for textile uses in the neighbourhood of one or two of the larger towns. Linseed, therefore, comes from a restricted area, and costs about $8.50 the load at Mexico City. The European oil could be imported into the country but for the duty on it.

The culture of the olive was forbidden in colonial days, Spain wishing to preserve the monopoly of the supply of olive oil. Moreover, the climate of Mexico does not seem to agree perfectly with the olive, which prefers the dry soils of temperate climes and exposure to the sea breezes. It is cultivated only in a few villages near the capital. The fruit is small, disagreeable in taste and very bitter, but the oil is good, with not too pronounced a flavor.

The castor oil plant grows in abundance all over the country, and in the warmest soils it reaches twenty feet in height and looks like a tree. About 60 per cent. of oil could be extracted, but with the primitive methods in use the actual yield is 35 to 40 per cent. A few small factories are installed in the producing districts, but they do their work badly and relatively expensively, the cleaning of the seed

being done by hand. The oil is used for soap making and for lighting purposes. As for the medicinal article, it is still imported from Europe. The expenso and difficulties of transport have always been in the way of attempts to export the seed, but it is asserted that a German firm at Vera Cruz has begun to send regular shipments of it to Hamburg. The load in Mexico City is worth $8.50.

Cotton grows well all over Mexico, and especially well in certain parts; but the want of field labour has restricted its culture, and it is chiefly grown as textile material. For the last fivo or six years cottonseed oil has been imported from Texas for soap making. The Mexican producers cannot compete with the price of this product, and have lost the sale of the article to the soap makers. The Government tried to help them by raising the duty on cottonseed oil, and sinco this increase came into force on Jan. 31 last two important oil factories have started at Torreon.

The chia is cultivated on the central plateau. Its seed resembles that of the colza, and the oil extracted from it is used as a substitute for linseed oil. It is very siccative, and could be used for art painting.

The cacahoanantzin is the name of a tree of which the seed gives 30 per cent of excellent oil. It is suitable for the manufacture of the finest soaps, but it seems to be very little used.

The chicalote is a thorny plant like a cardoon, which spreads so rapidly that it is a veritable agricultural scourge. Nevertheless, its seed gives from 25 to 30 per cont. of a limpid soil, which is said to be one of the best possible for paint. The Indians of Uruapan uso it for their famous paintings on wood and on calabashes, which resist boiling wator, and are as fresh after twenty years as on the first day.

The mammey (American mammeetree) has a nut which yields 40 per cent of fine oil suitable for perfumery and soap making. The work of extraction, however, is rendered dangerous by tho amount of prussic acid it contains, and, for want of a market, the oil is hardly produced.

The earthnut, called here cacahuate, produces from 30 to 50 per cent. of an oil which is used for the hair and for making fine soaps. In general the nut is only cultivated for eating in Mexico, and for other purposes is imported.

The coquito de aceite, or small oil coco, is the almond of a Sylvester pine which grows in abundance in several States. It is found in groves on the banks of some of the rivers, but the crop has been a good deal neglected so far, although the nut gives 65 per cent of an oil in high esteem for lubricating machinery and for soaps. A few factories extracting this oil are in the country, but the greater part of the nut crop is sent to San Francisco. The oil-cake is used as fuel.

The coconut is used only as a table delicacy, and fetches a relatively high price. It grows in abundance in several States, but the Mexicans do not yet seem to have hit on the idea of utilizing it for its oil. In Mexico City there are seven oil factories, the most important of which can treat thirty charges or loads a day. All of these factories use steam, and one or two of them have hydraulic presses and modern appliances. The capital engaged in the business may be put down at $300,000, and gives a return of from 30 to 40 per cent. The seeds treated here as a general rule are sesamum, rape, linseed and castor. Small quantities of coquitos, mammeys and olives are also sometimes treated. The industry of oil seeds may possibly have a great future before it, not because of local trade, which is of necessity restricted, but in view of the export business. Unfortunately, fate is against any great immediate growth of the industry; there is a want of field labor, a difficulty of transportation, and a heavy charge for freight to be overcome The ships calling at Mexican ports cannot expect a full cargo, and, consequently, double their prices, or, in preference, pick their return cargo at Buenos Ayres or in Brazil.—French Consular Report.—*Oil, Paint and Drug Reporter*, June 1.

CEYLON AND INDIAN TEA IN AMERICA.

The following is an extract from a letter, dated New York, 19th May, 1896, from Mr. R. Blechynden:—

Since the date of my last Report Mr. Mackenzie, the Ceylon Commissioner, has paid another visit to this country, leaving during the first week in April. During his stay he confirmed and extended the arrangements made during his previous visit, for the joint demonstration and advertisement of India and Ceylon teas. A considerable sum has been expended by Ceylon in advertising in magazines and journals. For some issues these advertisements were for Ceylon teas alone, but Mr. Mackenzie recognising that Ceylon was getting the full benefit of all work of every kind we did, met us in a fair and liberal spirit, and thenceforth the advertisements have been for Ceylon and Indian teas. I have sent specimens of the advertisements as they appeared for Ceylon tea alone and for Ceylon and Indian teas. The space taken by Mr. Mackenzie in the magazines was doubled on his return to the States, and is still for the teas of both countries. I will enclose specimens of the advertisement as it now appears in 23 different journals and magazines circulating throughout States; many of these are admittedly the best mediums for advertising of their kind existing. Some efforts have been made by the Advertising Agents to havo notices of "machine-made tea" inserted in these journals, and in a few instances with success. Most of the magazines aro however, not of a character to be able to introduce such "write ups," having no columns set apart for general notes.

In addition to the magazine advertising arranged for by Mr. Mackenzie. the columns of the regular daily press have been extensively used, and also certain commercial journals, Copies of the advertisements have been sent to you as they came out. In the commercial journals the publication of certain facts not creditable to China and Japan teas was first taken hold of, and the language used by the importers of these teas themselves condemning them in their efforts to impose an import duty on teas, were quoted and the advantages of Ceylon and Indian teas set forth. These advertisements were also used at first in the daily press. When the figures showing the remarkable increase in the use of our teas were published by Messrs. Gow, Wilson and Stanton, great use was made by us of them. More recently the remarks of the Chancellor of the Exchequer relative to the increased use of tea in Britain and his reference to India and Ceylon teas were made the text of the advertisements. These advertisements have been published in New York, Philadelphia, and Boston, in the dailies, and the New York commercial papers have a wide circulation in the States and Canada. In addition to these papers Mr. Mackenzie has had regular advertisements (whole page) in the leading grocers' paper in Canada.

The system agreed upon was to use the New York evening papers every week, and as for financial reasons it was impossible to take sufficient space to set forth what we had to say in any striking manner as an ordinary advertisement, we struck upon the plan of using rhyme with a small wood cut, trusting to the novelty of the method to attract attention. Specimens of these have been sent to you as they appeared. These rhymes are parodies upon popular airs, and sing the virtues of India and Ceylon teas. The types selected, the cuts used, and the form in which they appear make these advertisements "stand out" as they can be seen at a glance at the page on which they appear. Among advertisers we are given a good deal of credit for these advertisements and technical Advertisers' paper "The Newspaper Maker" commends them. I have also heard from several private sources that although they have been appearing for only a few weeks the advertisements are well known. The plan is to change the parody each week, and to keep the head line, and the cuts the same as a means of drawing attention to the article and identifying it as on the same subject I am assured that scores of people who do not ordinary read advertising matter read and "hum" the lines we publish.

A large number of leaflets with cuts, printed on "faced" or "coated" paper in two colours, were ordered by Mr. Mackenzie during his previous stay here. These were to be for Ceylon tea alone, but as we had agreed that all work would be more advantageous if done for the teas of both countries the requisite changes were made, and the leaflet appeared in the form of which I send specimens. Some 350,000 of these have been distributed through the different firms we have given grants to, and also through other channels, some through jobbers and from them to grocers, and others to grocers direct. The large number of applications we have received for copies made us determine to get out a fresh edition, which is now in the Press, and we have added this figures of the importations of tea into America. This edition will be one of 200,000, and, will be divided into batches of varying sizes, and on each batch the name of the firm through whom they will be distributed will appear. We find this a better plan than giving out plain copies, as the people who use them for distribution stamp their own names on them with rubber stamps, &c. and do not make as neat a job as we can have done by the printer. It is immaterial to us that individual firms benefit by this, as we are saved the immense (really prohibitory) cost of distributing them ourselves, and we are saying the same thing through numerous different mouthpieces.

I may mention here that a large number of leaflets on Ceylon tea, printed in London, were brought over here by Mr. Mackenzie on the previous occasion, and these, too, have been sent out through the same channels.

The matter of giving subsidies to certain firms on reasonable conditions has been the subject of separate letters, and as our relations with the firms in question are confidential, I will not do more than make this general reference to the subject here. I believe that the firms in question are loyally adhering to the points agreed upon, and are not shirking the responsibilities they undertook, One of the objects aimed at has certainly been gained, and that is our teas are being distributed not only in the large cities, but in many towns and villages as well, and we can hope, therefore, to get much of the advantage, which we would otherwise lose, out of the general advertising we are doing.

During February, arrangements were completed to introduce the system of giving away tea between the acts at other theatres, and finally we had the following theatres all at work at the same time:—Casino, Garrick, Herald, Square, Star, all in New York, and the Amphion, and Park theatres in Brooklyn. I have explained the plan in previous reports, and have only to say that while the cool weather lasted they were an excellent form of making the tea known and popular. The theatres are all closing now, and we have at the present time but two places in work, the Casino and the Garrick. I am only keeping these up on the present lines until I know more infinitely what the plans are for the future, as I think that iced tea might be used with advantage, but do not wish to undertake new plans at present.

At the 100th performance of the "Lady Slavey" at the Casino, we arranged that the souvenir given away on that occasion should be a silvered tea caddy of a very neat pattern, having a suitable inscription on one side, and the words "India, Ceylon tea" on the top. These were filled with tea, and nine hundred were given away to the ladies attending that evening. By the urgent representation of the manager, I agreed to share the cost of an additional 100 caddies, for distribution among the other theatrical managers, Press representatives, &c. The souvenir is said to be the best ever given away in a theatre in New York. The arrangement, made was that the cost of the caddies should be shared between the management and ourselves, we paying for the tea used. The management undertook to do all the puffing requisite, and gave out that the tea cost $10 per pound, and other stuff of that nature. The advertisement was a good one, not only because each recipient of the caddy is sure to remember the tea, but because the country papers all over the country must have had paras, regarding it, which we cannot trace. I will send sample of the caddies in duplicate as usual with all I send.

During one week we tried an advertising scheme, very clever in itself, but expensive. In the "Lady Slavey" there is a scene in which the American millionaire, the leading man character, is being entertained by a rich country grocer. The scene is laid in the Grocer's house, Snipe Manor, and he draws attention to some portraits on the wall. The American remarks that he supposes they are these of ancestors. The reply is "No, those of best customers," and at the same time, while both the audience and the people on the stage are looking at the portraits, they are brightly lighted up by means of a strong steriopticon, or some similar arrangement, and one reads, "Pure Ceylon and India tea." The effect lasted only a short time, and as we could not make terms for the American to make some suitable remarks about the tea, we left off after a couple of weeks' trial.

I have given several lectures at schools, &c., and recently gave one before the Women's Press Club, New York, at Carnegie Hall. Although the Meeting did not happen to be well attended this was the best one I have had from an advertising point of view, as it was mentioned by a number of papers (as usual it is difficult to trace them), and the report in one of them alone would, if measured and paid for at the usual rate, cost nearly $240, (*viz.*, 166 lines the aggregate measure, at $1·50 a line). In this case the lady reporter of the paper in question—*The Recorder*—happened to be there, and agreed to use notes of the lecture if I could send them in time, the lecture being on Saturday. I wrote them and sent them off at once, and she used them bodily, no doubt glad to get so much copy done without trouble. Still the advantage is ours.

I was not permitted to lecture at the Professional Women's League, as no man has the privilege of appearing there. Mrs. Tipton accordingly got up the lecture, which she has heard me give very often now, and was, I have no doubt, a very efficient substitute. At any rate, the notices we got from that lecture would, if measured up and paid for, cost two or three hundred dollars.—*M. Mail*, July 3.

THE AMSTERDAM CINCHONA MARKET.

Our Amsterdam correspondent, writing on Friday last, observes that the Java cinchona-auctions on June 11th were chiefly remarkable for the fact that for rich manufacturing barks (which were in good supply) prices were paid altogether exceeding the regular unit figure. The auctions included 1,150 kilos. of bark analysing from 8 to 9d per cent of sulphate of quinine, and 1,010 kilos. analysing from 10 to 11 per cent. The richest parcel at auction was one of 10 bales crushed ledger-bark from the Gamboeng plantation, which fetched 3·7½c per ½ kilo., equal to a unit of 3·40c, whereas the average unit for fair-quality barks was only 2·90c. Our correspondent adds that there must have been some special reason why these barks realised such high rates. Pharmaceutical barks of fine quality also fetched high prices, medium and ordinary grades were neglected, and mostly bought in. The bark stock in Amsterdam is now very light.—*Chemist and Druggist*, June 20.

The Pumelo in England: The Ignorance of Kew Gardens.—The *Fruit-Grower* of July 1 says:—

Another astounding statement comes from Kew Gardens which will probably become a standing joke in fruit trade circles. Mr. Morris writes us: "I have been asked more than once lately whether there is no fruit yet unknown to most English palates which might be introduced into this country, and form a pleasant article of food," and then he goes on to refer to the pumelow, or pomelo, as it is spelt in the trade, or shaddock, as being such a one. Considering the shaddock has been imported for years, and that in spite of the futile attempts that have been made to popularise it with buyers, it is amusing to find anyone writing so late in the day, and from Kew too, in such a strain. The shaddock, if it is a rival of any other fruit, is a rival of the lemon, and as the public prefer the latter to the former, there is not much likelihood of it ever becoming "a pleasant article of food" in this country.

BOTANIC GARDENS, GRENADA.

From the annual report for 1895, by W. E. Broadway, Curator, we make the following extracts:—

GENERAL REMARKS.

1. The Garden was founded in 1886 (Annual Report for 1891) during the administration of Sir Walter Sendall, K.C.M.G., then Governor of the Island, and since its existence has made on the whole considerable progress. If remarks from disinterested persons are worthy of notice, similar ones to the following are not uncommon—"a crab hole a few years ago, a respectable garden at the present time."

Though one becomes accustomed to the rapid growth of plants in tropical countries, yet it is often hard to realize that plants and trees could assume such proportions in the short space of time since their first being planted, and trees which were at first intended for shade purposes have had to be thinned out as they cramped one another, Eucalyptus, Samans, Ficus, and various Palms, have many of them grown into large trees.

From the main entrance one cannot but notice the healthy Oreodoxa palms on each side, which form a very pretty avenue. Passing the nurserie on the left, one continues along a straight road until the notice board to the office is reached.

From the office one gets a fine view of St. George's shipping in the Carenage, the wharf, Government buildings, the Fort and its flagstaff. From the second entrance to the gardens, one walks up an avenue of small palms and a selection of different varieties of Crotons. This, again, leads on to the coffee plantation on the right and to the orchard on the left.

INSECT PESTS.

2. Two large *Cassia florida* trees have been done away with, as every plant growing under their shade, or near them, have been continually covered by a soot-like substance. On examination, the cassia leaves proved to be the abode of numberless scale insects which we take to be the source of all the mischief. Specimens of these have been sent to Mr. F. W. Urich, F.E.S. of Trinidad, for determination, with other kinds of plant pests.

Another plant for a like attack is the Governor Plum. Trees of this, which form both a screen and wind brake in front of the office, are covered with a black coating. On the under side of the leaf several scale insects resembling the cassia one alluded to above may be observed. Scale insects, mealy bugs, and black stinging ants are a scourge to the Garden, each and all exist in unlimited numbers.

Grubs in fruit on the other hand are unknown, and caterpillars scarce, owing probably to the quantity of birds and lizards in the Garden.

A Ceylon tree (a species of *Cinnamomum*) has during the past eighteen months been a disfigurement to the Garden, due to its dirty black appearance. It stands in a prominent section near the rose beds, and its proximity to other plants affects those nearest to it with the same blight. We are trying to remedy this by removing the old soil from the surface, four feet from the base of the tree trunk outwards, and to a depth of a few inches, and by digging a trench around the outer extremity. Manure and rotted vegetable refuse replaces the old soil removed, and it is to be hoped this may in time have the desired effect in ridding the tree of its unnatural coating by inducing a more vigorous root growth.

In the determination of the *Coccidæ*, we beg to thank Mr. Urich for ready assistance already given in this direction.

PROFESSOR J. B. HARRISON'S VISIT.

3. The services of Professor Harrison, the Government Analyst of British Guiana, having been obtained by the Government, he visited the colony during the month of January for the purpose of selecting sample soils from different districts of the colony, and in so doing to enable by reporting on them to advise planters as to the deficiencies in their soils and the best manures to apply to them. As Curator of the Botanic Garden, the Government permitted me to accompany the Professor throughout his tour of Grenada and Carriacou, which gave me a splendid opportunity of meeting planters and proprietors and to note the agricultural position of the colony. As there has been no fitting opportunity hitherto, I make use of my present report to thank the following gentlemen for their kind hospitality and cordiality shown me when undertaking the tour in question:—

Mr. George Whitefield Smith, Bell Vue; Mr. A. J. Best, Carriere; Mr. G. Seton Browne, Dunfermline; Mr. F. Harford, L'Esterre; Hon. William H. Lascelles, Annandale; Mr. R. J. Graves, Minorca; Hon. F. Gurney, Mount Felix; Mr. Wm. Copland, Tufton Hall, (since dead I am sorry to say); Mr. G. DeFreitas; Corinth; Hon. D. S. DeFreitas, Dougaldston; Dr. Latour, Gouyave; Mr. Henry LaMothe, Grand Bacolet; Hon. James Paterson, Carriacou.

When visiting Carriacou the Hon. James Paterson most kindly went to the trouble of showing us over so much of the island as we could see during the hours at our disposal. Professor Harrison's report has recently appeared in the Official Gazette, January 13th, 1896. He remarks on the Botanic Garden:—"This soil is deficient in phosphates, potash, and available lime. Its retension power for water is low, I would recommend that the soil ought to be dressed with "mild" lime, *i.e.*, slake lime exposed to dry air until it has ceased to be Caustic, in quantities of about ½ ton to the acre. It requires the addition of large quantities of farm yard or pen manure. Its deficiency in potash will be best met by the use of Ohlendorff's early cane manure or similar preparations."

FORESTRY.

4. The rapidity with which Grenada is being denuded of its forest trees has assumed alarming proportions.

A circular referring directly to this subject was publish by the Hon. Edward Drayton when administering the Government of the colony last June.

The Governor, Sir Charles Bruce, K.C.M.G., is giving this subject serious attention and in the near future we hope to have plants prepared for the replanting of forest trees in a systematic manner. In December we planted on the Morne Rouge estate, which has recently been escheated to the Government, sixty small teak plants which may be regarded as the beginning to the forestry scheme.

The valley at the back of the dwelling house at Morne Rouge ought to prove suitable as an orange cultivation, as suggested by the Governor, the soil appearing fertile judging from the vegetables ("provisions"), bananas, and plantains reaped from it, and also on account of its being screened from high winds. The estate of Morne Rouge is accessible from town by either sea or land, and distant only some two miles.

Subsequent to the teak planting at Morne Rouge, the Spout Lands have undergone a partial cleaning, and logwood planted there. Eventually, the whole of these lands will be planted out in logwood. The Spout Lands are under the control of the Curator of the Botanic Garden.

CARRIACOU.

6. Six hundred Liberian Coffee Plants have been given to Mr. J. McNeilly on the Dumfries Estate for trial purposes in the Island of Carriacou.

At present the main products of that Island appear to be cotton, ground nuts, and ground provisions (vegetables)

It is also used for rearing sheep, cattle, and horses, for sale. Should this venture prove a success and coffee and cacao become established at Carriacou, it will be of immense advantage to the island, and Mr. McNeilly will be deserving of the thanks and gratitude of the Carriacou residents.

The Hon. J. Paterson, of Carriacou, is making efforts in a similar way. During the dry weather Carriacou looks as though a fire had swept over it, the grass becomes parched or dries up altogether owing in a great measure to the hills having been denuded of their tree growths, and as fast as saplings spring up, the continued destruction of these for fuel. In trying to establish permanent cultivations of coffee and cacao in a place like Carriacou, it would appear most essential to have ready before-

hand sufficient temporary shade, until the young trees get well rooted and have grown large enough to form their own shade by the extension of their branches in close contact with each other.

For this purpose, bananas and plantains might be thickly planted together the preceding season, so that there would be an abundance of shade for the young coffee and cacao when they are ready for their permanent places, and thereby protected for the dry season.

When the primary shade is established the young plants—the larger the better—should be planted out at the beginning of the planting season, so that every advantage be taken of favourable weather and the chances of failure reduced to the lowest possible degree.

The Government are willing to encourage the introduction of cacao and coffee into Carriacou and would allot plants for this purpose gratuitously, providing that the inital expenses of freight and packing be borne by those desirous of making the experiment, and also that suitable shade plants had been established the previous season. Forking the ground before planting is recommended, and during the dry season, independent of shade plants, the chances of success would possibly be greater if the ground was thickly covered on the surface by trash formed of dried fig leaves cut into convenient lengths: stable manure, if available, would be better still, or in fact any kind of partially decayed rubbish laid on the surface would be better than none. The reason for applying a covering or coating on the surface of the soil between and round the plants is to prevent the soil from becoming too dry. This process keeps the soil "cool" under normal circumstances. By loosening the ground during the growing season, and covering the soil over as advised during the dry season, it would be nothing extraordinary to expect success with coffee and cacao at Carriacou. Unfortunately, Parasol Ants exist there, though absent from Grenada.

Appearances suggest that pine apple cultivation would succeed at Carriacou. These might be grown in large quantities for export.

MINOR AGRICULTURAL PRODUCTS.

7. By direction of the Government, a report was written by the Curator on the Minor Agricultural Products of Grenada, for the Government of British Guiana, during the month of August. In connection with this matter, I beg to thank the Hon. James Paterson, Hon D. S. DeFreitas, and Mr. George Whitfield Smith for ready and willing assistance in replying to questions I addressed to them on the subject.

PLANT SALES.

8. We have this year only realized about half as much in cash as what we did the year previous, the sales amounting to fifty pounds (£50). But we have on the other hand more than trebled *in value* exchanges to that of 1893, for while in the latter year a sum of thirty four pounds sixteen shillings and eleven pence (£34. 16. 11.) stood to the credit of exchanges, we this year can show for a similar purpose one hundred and fifteen pounds ten shillings and five pence (£115. 10. 5).

Charges for coffee, cacao, kola, and nutmeg plants have been reduced by consent of the Government, and this, considered in conjunction with the general depression existing, accounts in no small degree for the smaller sale of plants. To show that plants are not grown on any principle of remuneration at the Garden, it might be necessary only to mention that coffee and cacao, irrespective of size, are disposed of at the rate of forty cents (1/8) per hundred plants —if in boxes, eight cents (4d.) extra. Boxes are only sold at cost price. Making money is not so much the object in view by selling plants, etc., at the Garden, as by increasing the distribution of good qualities of agricultural and horticultural plants, by exchange.

PROPOSED AGRICULTURAL SCHOOL.

11. This scheme initiated by the Governor has fallen through, for the present at all events, for want of support and encouragement. It was His Excellency's wish to attach boys to the Botanic Garden where they might be taught practical subjects in relation to agriculture and horticulture, which could not fail to be of benefit to them as future planters or small peasant proprietors. It was proposed to pay them at the rate of seven pence (7d.) per day.

UNCARIA GAMBIER.

13. The Director of the Royal Gardens, Kew, has sent us on different occasions seeds of this tanning plant, but up to the present time we have not succeeded in getting a single seed to germinate, although we have tried it under different conditions, as well as following out the Kew circular instructions as to how to grow it from seeds. It is however, on record that seeds germinated once in this Garden, but died off when only an inch or two in height. It would be interesting to learn of the successful fruiting of the Dominica and Trinidad plants which were reported to be doing well sometime ago. The chances are, if these fruited, plants could be raised, as the seeds would then be obtained and sown immediately with the further advantage of being acclimatized.

COFFEE.

14. The Arabian and Liberian have continued to do well. From the Arabian trees which were grown from seeds of the true Blue Mountain coffee of Jamaica that were received direct from the colony in the first instance, an excellent crop of cherries was picked during the latter part of the year, and the seeds sown for propagating purposes.

This is another year's proof that the Arabian varieties do well at or near sea level in Grenada. Upon the Waltham Estate in the parish of St. John's, one of the properties of the Hon. Macaulay Browne, it is reported upon good authority that it does there remarkably well, although close to the sea. Some of the Liberian at the end of the year had cherries upon them which were advancing to the stage of maturity. These are now but slightly shaded with young saman trees, and banana plants. It is evident from observations made at the Garden, very little shade indeed is required for coffee plants that have attained the age of three or four years.

Were it not for the dry season, shade could be entirely dispensed with. Shade trees often harbour insect pests which attack the coffee, and from the frequent dropping of branches injury is also done to the coffee trees by breaking and splitting off the living branches. A vigorous growing coffee tree bearing large very dark green leaves, and a crop of large cherries in the Liberian coffee plantation, answers well, in my opinion, to the description given in "New Commercial Plants and Drugs," No. 7, Christy, London, 1884, for the Maragogipe Coffee of Brazil. The seeds will be sown when ready, so that we may be enabled at a later date to offer plants for distribution to planters. The three *Coffea stenophylla* plants are at a standstill. A fourth kind of coffee growing at the Garden was presented to us during the year by Mr. John McPhail, St. John's, under the name of "Menuda." Mr. McPhail obtain this variety from the Trinidad Gardens during Mr. Prestoe's time.

A Coffee Commission composed of the Hon. D. S. De Freitas (chairman), Mr. A. Ross, Mr. G. E. St. George, Mr. H. LaMothe, Mr. G. Whitfield Smith, with Mr. Septimus Wells as Secretary, was instituted by the Governor during the year, in the interests of Agriculture. Sittings were held in each of the parishes to collect information from planters, and their deliberations are to appear, it is understood, in a voluminous report early in the ensuing year. Without anticipating the Commissioners' report, it is worthy of notice that persons have become aroused over the coffee question, and, in consequence, the supply of young plants has fallen short of the demands. We are making strenuous efforts at the Garden in preparing ourselves to meet a reasonable demand for plants when next planting season comes round.

SICILY LEMON.

15. At the request of His Excellency the Governor, seeds and plants of this commercial lemon were procured with the view of propagating it in quantity. None of the seeds germinated.

Of the small plants received we have a dozen now growing, but at a very slow rate. The order for seeds has been repeated, and it is hoped that when received better results will be obtained.

PINE APPLE.

16. A small patch of land at the base of Richmond Hill has been planted with pine apple suckers. During the past year the fruit obtained from the usual pine section were small in size, inferior in flavour, and on the whole, very disappointing. As the section taken up by pine culture is considerable and runs into a few thousand plants, much time and labour are absorbed in their cultivation and maintaining in anything like cleanly order. The only reason of failure which suggests itself is that the ground had become "worn out" and requires a change of cultivation.

There are always numbers of willing purchasers during the pine season, some taking as many as a barrelful at a time. There is evidently an opening for private enterprise in this direction and would give satisfactory returns. In the cultivation of pines, sandy well drained soil is considered necessary for the development of good size and well flavoured fruit, providing desirable sorts of suckers have in the first instance been procured. We can supply these at certain times of the year in limited quantities.

BANANAS AND PLANTAINS.

17. Mr. Jenman, of the Botanical Department, Demerara, sent us, last May, suckers of amed bananas and plantains. These together with additional plantain suckers of the "giant" kind obtained in the colony, have been planted to enable us subsequently to have suckers available for distribution.

We have experienced difficulty in procuring even a dozen or two of the giant plantain suckers locally. In Grenada there are two sorts of plantain the "giant" and "common." Good sized bunches of plantains sell in St. George's for as high as two shillings and sixpence (2/6) the bunch as cut from the plant. Mr. Jenman writes me in reference to the plantains grown in Demerara:—

"Here, where they are grown on a large scale, often several hundreds of acres in a continous stretch, the farmers say, without thieving or disease, it would pay them to sell medium size bunches for twelve cents (6d) on the fields."

"AGAVE RIGIDA SISALANA."

18. Towards the latter part of the year, large asparagus looking heads began to appear above the leaves, showing that their flowering period had arrived.* No machine with all the desired requirements having been brought to our notice, a trial was made at decorticating the sisal hemp leaves by hand labour, on the principle adopted in the Bahamas by the peasantry there. The results of our experiment were not encouraging.

GARCINIA MANGOSTANA.

19. A small plant brought from the Trinidad Botanic Garden, in July 1891, has made such slow progress since it was planted that it is now scarcely any bigger than what it was at that time. Yet it looks healthy. It is a fact well known to people on this side of the West Indies, how notoriously stubborn young plants of the mangosteen are to grow at all. Our plant is placed on the section which is chiefly reserved for nutmegs. We should be gratified to any correspondent who would be generous enough to add a young Durian plant to our collection.

PASSIFLORA SP.

20. The seeds of this passion-flower came from Mr. J. C. Lewis, Trinidad, and were sown when received. From them we have procured a few plants which are now under trial. A memorandum which accompanied the seeds stated it came from Brazil, and from its fruit a good preserve is made. So far the plants have not flowered.

NIPA FRUTICANS.

21. On November 20th we planted at the Grand Etang, thirteen plants on either side of the jetty, and close to the margin of the lake. This palm is a native of tropical Asia and Australia where it abounds in the estuaries of rivers. Its leaves are used by the people of those parts for roofing their houses. These plants were raised from seeds received from Mr. Jenman, of Demerara, and had out-grown the space allotted them in the Garden tanks. Two remain in the permanent collection, one of which flowered for the first time this year. A saline element is considered a necessity to the Nipa in its natural home, yet it has flowered well in the aquatic tanks which are supplied with fresh water from one of the St. George's reservoirs. Their growth has been rapid and vigorous. It will be interesting to note how these plants thrive at the Grand Etang, where the water of the lake is very fresh and is situated amidst the highest mountains and most central part of the island, with an almost cold atmosphere.

BERTHOLLETIA EXCELSA.

22. Plants of the Brazil Nut have made no progress. These came from the Trinidad Gardens in July 1894.

PALM CULTIVATION.

There are innumerable sites on our tea plantations at present unutilised, such as in and around the coolie lines and factory buildings, sides of roads and tanks, etc., where palms might with advantage be put down. The *Phœnix dactylifera* or date palm, some dozen or so of which were successfully grown at Coochela in Hylakandy in the later sixties, succeeded well. If any of our planters would care to essay the cultivation of this plant, it would be advisable to go to the expense of obtaining the seed from Rio Janeiro, Pernambuco or other semi-tropical South American port, as the trees of these places frequently yield 3,000 fruits in one bunch. As a general rule the date palm lasts for twenty years, commencing to yield in the fourth, if grown for the fruit alone and not tapped; though responding to cultivation and generous manuring it will flourish pretty well if left to itself, merely guarded from cattle and goats by the usual bamboo fascine, until the crown is high enough to be beyond the reach of these animals. Much may be done in the way of care and attention to improve the *dactylifera* indigenous to Lower Bengal, but fresh stock would be preferable. The date palm is not likely to thrive, or, rather, mature its fruit, within the influence of the rain belt so that the drier localities only should be selected for its propagation, and there is ample land and to spare in South Sylhet, Cachar, and other place in Assam, where the date would prove no mean addition to the income of the factory, besides affording an inducement to the labour force to remain on the place.

The areca palm, commonly called the beetle nut tree, is too well-known to need any detailed description, and is so familiar that its gracefulness excites but little admiration except among new comers. The areca can be raised even on the banks of garden roads, for the shade given is so infinitesimal, that it would but affect the tea out-turn in a very slight degree, and this "arrow shot from Heaven," as Sir J. D. Hooker once described it, would add greatly to the appearance of the factory. The best nuts for planting are to be had at Shella, Terriah Ghat, Lakat and as far as Jaintiapur on the north side of Sylhet, as they are all grown on the limestone formation and are free from the canker worm which effects the palms grown away from the hills. An acre would contain in round numbers 1,600 plants, the usual income from which is reckoned at 4 annas each, so that the areca is worth attention from a commercial standpoint. The fibrous envelope can be removed by passing the fruit, after being well dried in the sun, between wooden rollers studded with nails, after the pattern of the country cotton gins. If estate owners who care to take up palm cultivation on an extensive scale, will go to the expense of importing economic palms from other countries, there are many, the cultivation of which would pay handsomely. The sago, which is abundant in the jungles, is hardly worth attention for Assam, nor any part of India, can compete with the West Indies in this and similar starches, high as is the price of labour there. *Elais guineensis* and *E.*

melanacca furnish the celebrated African palm oil, the ripe fruit being crushed and boiled, the oil skimmed and strained. Coconuts we may pass over, for though the palm will grow, the fruit seldom attains maturity when removed far inland; the heart wood is, however, of value, so that if land is available a few hundred nuts may be put down in out-of-the way places. A kind of wax oozes from the lower surface of the leaves of the *Copernicia cerifera*, also from the trunk and between the leaves of *Ceroxylon andicola*. The fruits of *Caryota saquerus* when soaked in lime water lose their acridity and can then be made into a very palatable preserve. *Areca oreluca* is the Indian cabbage palm, the buds being steamed (not boiled), forming a pleasant substitute for the vegetable whence it derives its name. This plant is indigenous along the hills overlooking the Sylhet plains and may readily be distinguished in the jungle by the silvery appearance of the underside of the leaf. *Borassus flabelliformis* gives the handsome Palmyra wood. Coquilla nuts much in request among wood turners, are the produce of *Attalea funifera* and vegetable ivory is yielded by the *Phytelephas macrocarpa*. *Calamus draco* is a plant from which dragons blood is obtained. Space will not admit of our going *seriatim* through the whole list of palms, so we have contented ourselves with indicating those suitable for cultivation in Assam, and of the greatest commercial importance, giving the botanical names, so that importers of exotics in England may know what is required. The majority, however, of these palms are obtainable within the country, some indigenous in the unjhumed jungles, others are probably to be had from one or other of the botanical gardens. If the Agricultural Department was kept up to the collar, an economic plantation, similar to those which all civilised Governments possess, would be established, from which plants and seeds could be distributed much to the benefit of all agriculturists in the country, ultimately enhancing the revenue.—*Indian Planters' Gazette*, June 27.

CULTIVATION OF CACAO IN MEXICO.

An interesting report has been issued by the Foreign-office on the cultivation of cacao, vanilla, india-rubber, indigo, and bananas, in Mexico, all of these crops flourishing in the warmer lands of the republic. Mr. (now Sir Henry Nevill) Dering, Her Majesty's Minister at Mexico, who supplies this report —which is based on articles published from time to time by the Mexican Information Bureau states that he has been induced to forward it as he is of opinion that the information respecting the cost of cultivation, the district in which each crop may be advantageously raised, as well as a statement of the pecuniary results to be obtained with proper care, may be valuable to many persons with small capital —say £1,000 to £2,000—who may be desirous of investing the same in a country offering exceptional advantages. He also adds that the necessary dwelling-houses, or simple ranche, for personal occupation on a plot of ground purchased for the growth of any of the above crops, may be set up at an expense considerably less than the cost of an ordinary labourer's cottage in England. The cacao tree is a native of Mexico, and, long before the conquest, the Aztecs and other ancient Mexican tribes used the fruit as one of their alimentary beverages. They prepared a drink called "chocolatl" by mixing the seeds, after having crushed them together, with fine corn meal, vanilla ("tlilxochitl") and a species of spice called "mecaxochitl," and those who drank it were a picture of health. All nations subjugated under the Aztec Eagle had to bring among other valuables a certain number of bags of cacao to the palace in the great Tenochtitla as an annual tribute to the Emperor. It was so highly prized amongst the ancient natives that in trade it was utilised as currency among the lower classes. The varieties cultivated were the "quanhcahuatl," "mecacahuatl," "zochicacahuatl," and "tlacacahuatl." The bean of the last one was very small, analogous to the kind found at present at Soconusco, Chiapas. The tree is found growing wild and in cultivation in the States of Colima, Michoacan. Guerrero, Oaxaca, Chiapas, Tabasco, and central and southern Vera Cruz, where the elevation is from 100 to 1,200 feet above sea level, but Chiapas and Tabasco are noted as being its home, the climate and soil there being more particularly adapted to its culture and development than any other portion of the globe. The species of cacao tree most cultivated in Mexico are—Cacao or *Theobroma ovalifolia T. bicolor*, *T. augustifolia*. There are other kinds known, generally found growing wild, which come under the head of the Guazumæo or guacima, *Guazuma polybotrya* being the principal species. A warm, moist climate, having a mean temperature between 76° and 77° Fahrenheit is necessary for the cultivation of cacao if large crops are expected, but when the soil is suitable the tree will grow and yield fair returns on a moderately dry or well drained place. The best elevation is from 300 to 500 feet, and in sheltered situations near the seashore good crops are to be obtained, but the tree will not thrive if exposed to the direct influence of the sea breeze. Cacao will not bear much exposure, hence sheltered lands and valleys should be selected, and on the Gulf side of Chiapas, Tabasco, and Vera Cruz northern and eastern aspects should be avoided. Cacao plants are obtained from the seed, which germinates readily and quickly, and the seed, when sown, is covered with vegetable mould or loose loam mixed with horse manure, and over that banana leaves. The bed is sprinkled every day for 12 or 15 days when seedlings appear. Then the banana leaves are removed, and sheds made of palm leaves and sticks so fixed that they can be raised as the seedling grows, should be placed over the nursery as shade and shelter A year after sowing, seedlings are about 20 inches high, and ready for transplanting. Returns from a cacao plantation cannot be expected until five years from transplanting. At two years old the tree, on rich soil, stands 5 or 6 feet high; when 7 or 8 feet high it begins to bear, but it is not in full bearing until it is between 10 and 12 feet high. The average yield of dry cacao from each tree varies very much: the limits may be said to be from 1½ to 8 lb. per tree. Some trees in the plantation of "La Carolina," district of Macuspana, in Tabasco produce 220 pods and plantations in Alvarez, Colima, and in Apalzinghan, Michoacan yield on an average 5 lb. to the tree. The pods having been gathered, are placed in heaps under the trees; they are then taken to a place, called quebradero, where they may be broken at once or left for a day. The kernels or nibs are then taken out of the pods which either opened with a machete, or a knife made from a wood called Jahuate. As the seeds are extracted from the pods, the former are thrown into wooden troughs called "tollas," half filled with water, to wash them, and the beans are then carried away to the cocoa house for the sweating or fermentation process. When the beans have been properly sweated, they are dried ready for shipment, and this drying process is complete as soon as they produce a crackling sensation when pressed between the thumb and forefinger or when the parchment (outer skin) breaks off easily. As to cost and expense, generally, cacao planters in Chiapas and Tabasco make contracts, paying 90 to 100 dollars (Mexican dollar may be taken as equivalent to 2s 2d.) per 1,000 trees, to be delivered in a state of production in four years, the plantation to be in good condition and with proper shade. The contractor keeps the products and first crop of the plantation. If the planter has his own labourers, he pays them from five to eight dollars per month and rations, then the cost will be from 70 to 80 dollars por 1,000 trees. When the labour is not done by contract but by "jornales" or tasks, the cost for six years per hectare (2·47 acres) is 191 dollars for 750 trees. The expense of collecting, drying, and sacking the seed is from three to five dollars per cargo of 60 lb. Thus 750 trees will produce the planter 75 cargoes (4,5000 lb.), the price of which is from 20 to 22 dollars per cargo at the plantation. Deducting the cost of curing, he will have a net annual profit of more than 1,225 dollars, besides the produce obtained, from side crops.—*Journal of the Society of Arts*, June 19.

MR. ROGIVUE'S WORK IN RUSSIA.

From Mr. A. Philip, Secretary of the Thirty. Committee, we have received the following copy of a letter received from Mr. Rogivue regarding his work in Russia :—

Moscow, May 31st/June 12th, 1896.

A. Philip, Esq., Secretary to the Thirty Committee, Kandy.

Dear Sir,—Confirming my last respects of the 8/20 May and acknowledging receipt of your valued favour dated 15th May, I now beg to hand you enclosed account of expenditure under the grant of £1,000 stg. voted on the 20th July 1895.

From my statement you will see that the total amount I have expended is considerably moro than the £1,000 granted to me, but the results I think justify this, for not only do I notice an increase in my sales and a general extension of the business all over Russia, but also that the export from Colombo to Russia direct from 1st January to 20th April, 1896, is more than double what it was for the corresponding period of 1895, the "Times of Ceylon" giving the following figures in its list of export disribution 1895-96.

1st January, 20th April	1896	1895
Tea to Russia	159,597 lb.	70,528 lb.

Again the figures quoted in the tea report of Messrs. Gow Wilson and Stanton for 13th March, 1896 show how largely the re-export of Ceylon tea from the United Kingdom to foreign markets is increasing, special mention being made about Russia and attention drawn to the fact that the bulk of the tea shipped to Germany is for Russia. The numorous and frequent advertisements in the newspapers of every part of this Empire have been a great success as evidenced by the many new enquiries I have received about Ceylon tea from all quarter of Russia. By means of numerous free samples and by giving bonuses over and above the usual trade discounts and supplying tea in thefirst instance frequently at cost price I have induced many new people to give Ceylon tea a fair trial which generally means a continuation in its use, so I think it would be by all means advisable to continue the above methods for another year.

Nijni Exhibition.—As I wrote to you in a previous letter I was not permitted to build a pavilion within the Exhibition grounds, but have arranged to have on two of the cars of the electric tramway which runs right round the inside of the exhibition, a large advertisement (8ft by 2ft) setting forth the advantage of Ceylon Tea, the latter words being in very large letters and the most prominent feature also, inside all the cars. I am having my placards fixed as well as in all the rooms of the largest hotel of (and nearest to) the exhibition, on the grounds of which between two wings of the building and forming the main entrance to the hotel, on the high road close to the principal gate of the exhibition, two pavilions will be erected in the Hindoo style (each 15 feet square) joined by a large arch 36 feet span by 6 feet bearing the words "Ceylon Tea" prominently painted thereon in huge letters, the whole being nicely decorated and lighted outside by three large electric arc lamps and inside by incandescent. One of these pavilion will be for the sale and distribution of tea in packets, the other for the testing and free distribution of tea in cup.

These Pavilions for the building of which I have made a contract with a competent architect, are to be finished by the 15th June (Russian style and though the exhibition was officially opened on 28th May (Russian) it is so far from completion that it will not be ready until about 20th June and no large attendance is expected before that date. During the time of the exhibition I am having a special announcement published in 5 Moscow and 2 Nijni papers, inviting people to come and try the famous Ceylon tea at the Ceylon Tea Pavilion at Nijni.

I am also having new brochures and leaflets printed specially for the occasion. I experienced great difficulties in obtaining a position to erect a building on and could get no assistance, but rather the contrary from the authorities of the exhibition and town.

Finally I obtained the present place by private arrangement with this hotel "Frantzia."

I will keep you informed as to how matters progress at the exhibition, and all that concerns Ceylon tea in Russia.—I am, dear sir, yours faithfully,

(Sgd.) M. Rogivue.

TEA COMPANIES AND SHARES.

On the one hand, we hear nothing but good of the condition of Ceylon tea plantations and the prospects of the enterprise; and yet, on the other, we find an unusnal and decided depression in the Ceylon tea share market. Possibly, this may be partly due to the comparatively large receipts of tea and a consequent weakening in price; but the more direct and immediate canse is, undoubtedly, the report of depression in the Colombo market and the transfer of a considerable number of tea company shares thence to London to be disposed of. So far, again, as this check is due to action on the part of Colombo bankers to check speculation, it must be regarded with favour rather than censure, by all prudent colonists and *bona fide* investors. The danger of a crisis arising through banks making advances on the security of tea scrip, such advances being used to buy up further shares in new companies, was a very real one; and a cessation of the practice—if, as we hear such has prevailed and has now been stopped,—has not come a day too soon. There can be little doubt that, after a temporary check, the share market will recover itself and become stronger than ever probably, in view of the sounder basis on which the business will then rest. There is nothing to indicate a permanent fall in prices, or other than a good crop season in Ceylon, with the usual dividends and in proportion to these, it cannot be said that the value of shares rose too high. But it is well that individual capitalists or investors should understand that the less bowed money is introduced into the purchase of tea or any other shares the better.

The fact that there is no abatement of public confidence in the Metropolis, in tea cultivation in Ceylon and India, as an investment, is shown by the favour extended to new companies, even though they appear at a time when the share market is said to be depressed. Sir John Muir's gigantic company—being mainly a consolidation of two existing companies—may be said to be somewhat exceptional; but though criticised a little sharply in one or two City papers, the demand for shares among even hard-headed men of business, on the chance of getting some of the surplus portion, is specially keen. But still more to the point, is the fact that Messrs. Chas. Strachan & Co.'s Gallaha Company should be in so much favour that all the capital available for the public is, practically, over-subscribed before the prospectus has appeared. True, the ordinary shares in this company are retained by Mr. Strachan in his own hands—only debentures and preference shares being made available. But, all the same, confidence in the Ceylon tea enterprise must be indicated by the facts above stated, and by the encouraging offers we have heard made of late to individual proprietors with plantations for sale.

A good deal of the criticism extended to Sir John Muir's company must be deemed personal and indeed puerile. Of this type is a paragraph in the editorial columns of the *Daily Chronicle*, condemnatory of Field Marshal Lord Roberts lending his name to a tea company directorate, forgetful of the fact that Lord Roberts had long

been connected with the Sylhet Companies and that a lifetime spent in India might well give even a military man a warm interest in, and special acquaintance with, the working of tea cultivation companies. But in this direction the *City Leader* excels in a leader now sent you,—entitled "A 'Swagger' Prospectus"—the theme of Lord Roberts being again prominent, as well as some childish remarks on the title of the company. Far more businesslike is the analysis offered by the *Financial News* in an editorial (also forwarded) on "Indian Tea Companies" with the "Consolidated" and some other companies for the main theme; but dwelling generally on tea investments deserving more attention than they have hitherto received—in, we suppose, the regions of high finances. This is due to the absence of public quotations for the large majority of companies. Out of 75 of these undertakings known to our contemporary, only 13 are quoted in the official list; but a study of many more shows they offer very desirable investments. *Fairplay* of the 18th instant is also very favourable to the big company as may be seen from the following:—

The Consolidated Tea and Land Company is about the strongest thing in the shape of Companies that has come out for some time. The total capital, as will be seen from the advertisement, is £2,000,000. The board of directors is exceptionally strong, with Sir John Muir, Bart., at the head, and comprising some of the best known names in the commercial world. The Company is formed to take over, as going concerns, a number of tea estates in India and Ceylon, and is sure to be regarded as a safe and good investment.

But it is more interesting to read what the *Exchequer* of yesterday's date has to say on the tea trade and on tea-growers in a brief editorial:—

So much attention has lately been given by the investing public to the Indian and Ceylon tea trade that the review of the year up to May 31 will arouse interest. The various firms that issue these reviews evidently prepare them with care; and while they are perhaps a little technical and difficult to understand on the part of the mere investor, it must be admitted that, so long as the information is given, it is all that can be fairly expected. For India and Ceylon the twelve months show expansion, the production continues to increase, the consumption at home was larger than ever, and trade with other countries marks a substantial advance. To tea-growers the season brought substantial remuneration, said to be "so considerable in comparison with the general earning power of capital as to make this industry conspicuous when contrasted with others." The history of the season offers many points of contrast to that of 1894, but resembles the season of 1893 in the higher price of fine tea and the lower price of common, a great and growing consumption, and a wider demand for the teas from abroad. The influence of foreign orders upon the Calcutta and Colombo markets has been considerable, and for the future it is pointed out that it will be necessary to be more circumspect about fixing buying prices in this country in face of the growing competition among Indian producers. Importers of Ceylon teas, which have lately been attracting some notice, have seen the wisdom of regular sales at the date of importation, arrivals being sold, as a rule, within three weeks, the result being that a large trade is worked upon a small stock, and the desired increase of consumption attained. There is quite an active market now in Indian and Ceylon tea shares; and it is evident, from the condition of the industry, that this is likely to go on expanding.

There is no indication here of depression even in the share market, and, indeed, the check in the case of the Ceylon portion may be regarded as merely temporary and due to a cause—the application of principles of sound financing in Colombo—which is likely to place the market on a sounder basis than ever before. J.F.

THE GALAHA CEYLON TEA ESTATES AND AGENCY COMPANY, LIMITED.

Share Capital, divided into 6,000 Cumulative Six per cent preference shares of £10 each	£60,000
5,000 Ordinary Shares of £10 each ..	50,000
	£110,000
Debenture Capital 550 Five per cent Mortgage Debentures of £100 each ..	55,000
	£165,000

The debentures have been subscribed for privately, the ordinary shares are reserved for allotment to the vendor in part payment of the purchase-money, and applications are invited for the 6000 cumulative six per cent preference shares of £10 each at par, payable as follows:—

On application ..		10 0	per share.
On allotment ..	2	10 0	,,
On 1st Aug. 1896 ..	7	0 0	,,
	£10	0 0	per share fully paid up.

The preference shares confer the right to a fixed cumulative preferential dividend at the rate of six per cent per annum and the right to repayment of capital in preference to all other shares.

Directors.—Charles E. Strachan, Esq., Colombo, and 6 Balfour Place, Mayfair W. (Chairman); M. P. Evans, Esq., 17, Airlie Gardens, Kensington, W.; William Harwood, Esq., 29, Palace Gate Kensington, W.; W. L. Strachan, Esq., Kelvin, Ceylon and 35a, South Street, Mayfair, W.

Solicitors.—Messrs. Harwood & Stephenson, 31, Lombard Street, E.C.; Messrs. F. J. & R. F. De Saram, Colombo, Ceylon.

Bankers.—The National Bank of Scotland, Limited, 37, Nicholas Lane, E.C., Head Office in Edinburgh, and Branches in Scotland; the National Bank of India, Limited, Colombo.

Brokers.—Messrs. W. I. Carr, Sons & Todd, 2, Royal Exchange Buildings, E.C.

Auditor.—A. N. Frewer, Esq., A.C.A., 34, Nicholas Lane, E.C.

Secretary (*pro tem.*) and Officers.—P. E. Hervey, Esq., 39, Lime Street, E.C.

This Company has been formed for the purpose of acquiring, carrying on, and developing—

1. The group of Freehold Tea Estates, Galaha, Goorookelle, Goddawella, Kirrewana, Kitoolmoola, Dunally, Monsakelle and New Maddegama, and East. West, and North Vedehettes, situate in the Nilambe and adjacent districts of Ceylon, containing 4,874 acres, of which 2,397 acres are now under tea, and 107 acres are under cardamoms.

2. The freehold property, with the Central Tea Factory thereon, known as the Galaha Factory, situate on the Government Cart Road, 10 miles from Peradeniya Station, on the main line of railway to Colombo.

3. The freehold property in Colombo, containing nearly 3 acres, known as the Union Mills, consisting of coffee mills, Cinchona presses, warehouses with ample accommodation for storing tea prior to shipment, manager's bungalow and offices.

4. The general and agency business of Messrs Charles Strachan & Co. in Colombo, now carried on by Mr. Charles E. Strachan, the Vendor.

The estate comprise approximately—

1,635 acres tea in full and partial bearing, upwards of three years old.

516 acres tea, one to three years old.

246 acres tea in course of planting.

107 acres cardamoms.

276 acres cleared and forested for fuel purposes.

2094 acres forest, patna, &c., of which a large portion is considered available for tea cultivation.

In the season 1894-95 the crop was 549,357 lb. tea, which was sold for 7·02d per lb. net. The crop of season 1895-96 is estimated at 757,000 lb. of tea, of which already 613,920 lb. have been received in London, and of this quantity 510,510 lb. have been sold at a net average of 7·23d per lb.

The estimate of cardamoms for the latter season was 16,500 lb., of which 7260 lb have been sold at a net average of 1s 11½d per lb.

The whole of the leaf is manufactured at the Galaha Factory, which is most conveniently situated almost in the centre of the estates.

The vendor's estimates of crop from the estates for the present season, from 1st July, 1896, to 30th June, 1897, are as follows, viz:—

880,000 lb. tea at 7d net	£25,666	13	4
20,500 lb. cardamoms at 1s 6d net ..	1,537	10	0
	£27,204	3	4
The profits on the Galaha Factory and Colombo business during that period are estimated by the Vendor as follows :—			
Galaha Factory	967	5	5
Colombo Mill and business ..	1,086	5	7
	£29,257	14	4
The working expenditure for the same period is estimated by the Vendor at	15,711	11	11
Taking the year's profit on this basis at	£13,546	2	5
After paying interest on Mortgage Debentures £55,000 at 5 per cent ..	£2,750	0	0
And a Dividend of 6 per cent on 6,000 six per cent Cumulative Preference Shares	3,600	0	0
	6,350	0	0
There should remain a balance for the first year available for the Reserve Fund and the Dividend on the Ordinary Shares of	£7196	2	5

The Directors anticipate a considerable yearly increase of profits, not only from the Tea Estates themselves, by reason of the larger yield per acre from the Tea now in bearing, and from the 762 acres of young Tea coming into bearing during the next three years, but also from the consequent extension of the business in Colombo.

The Estates are well equipped with substantial Bungalows and Buildings, and with permanent Coolie Lines. The Galaha Factory, erected at a cost of about £13,000, is a substantial stone building, fitted with all necessary modern machinery for Tea manufacture, and will be capable of turning out 2,000,000 lb. of made Tea per annum, when the extensions now in course of construction are complete. The purchase includes all the Live and Dead Stock, Machinery, Tools, Furniture, and Fixtures on the Estates, and the Machinery and Office Furniture in Colombo, but the Company will take over at a valuation all stores purchased by the Vendor for future use and in hand on the 1st July, 1896.

A Tramway of 2¼ miles in length has recently been constructed at the cost of £4375, to bring the leaf to the Factory, resulting in a considerable saving of labour and expense.

The Coolie labour force on the Estates is ample.

Messrs. M. P. EVANS & Co. have hitherto acted as Consignees and Agents of the Estates in London, and have agreed to continue to do so, and the businesses in Ceylon will be carried on without interruption by the present staff.

Mr. CHARLES E. STRACHAN, the Vendor, who has managed these Estates and business for many years, has agreed to act as Managing Director for a term of five years, without any remuneration beyond the ordinary Director's fees.

The price to be paid by the Company for the purchase of the estates, properties and businesses, free from incumbrances, has been fixed by the Vendor at £155,000, payable as to £50,000 by the allotment of 6000 Ordinary Shares, and the balance in cash. Taking the prices of the Galaha Factory at the above sum of £13,000, and of the Colombo Mills and Agency business at only £12,000, and the price of the uncultivated and reforested land at £5 per acre, the price per acre of the land under Tea and Cardamoms is under £47 5s per acre.

The Vendor will discharge all outgoings and liabilities belonging to season 1895-96, in respect of the Estates, Mills, and business up to the 1st July, 1896, from which date the Company will take possession, and be entitled to the profits, but the Company will repay the Vendor all advances made by him before that date, on account of the season 1896-97.

The Vendor will pay all the expenses of and incidental to the formation and registration of the Company up to the first general allotment.

The Directors propose to appropriate £10,000, the proceeds of 1,000 Preference Shares of the present issue, for working Capital and the further development of the estates.

The following Contracts have been entered into, viz.:—

A Contract dated 27 June, 1896, between Charles Edward Strachan and this Company, being the Contract for the acquisition by the Company of the above-mentioned properties, and a Contract dated 27th June, 1896, between this Company and Matthew Pennefather Evans, Willian Dunn, and John Pennefather Evans, trading as M. P. Evans & Co., being the Contract under which the latter are to act as Consignees and Agents of the estates in London.

The current contracts entered into by the vendor in the ordinary course of business, and, as to the debentures, may, however, constitute contracts under Section 38 of the Companies Act of 1876, and applicants for shares must be deemed to have waived further specification of any such contracts.

Nothing has been or will be paid in respect of promotion or underwriting.

It is intended to apply to the Committee of the London Stock Exchange for an official quotation of the Preference Shares.

Copies of the memorandum and articles of Association and contracts can be inspected at the offices of the Solicitors to the Company.

Applications for Preference Shares should be made on the form accompanying the Prospectus and be sent to the Company's Bankers with the amount payable on application. If no Allotment is made the deposit will be returned in full, and where the number of shares alloted is less than the number applied for, the balance will be applied towards the payment on allotment.

Prospectuses with Forms of Application for the Preference Shares can be obtained at the Offices of the Company, or from its Bankers, Brokers or Solicitors.

27th June, 1896.

METROPOLITAN NOTES.

LONDON, June 26.

I omitted in my last to refer to one significant remark made by Mr Quinton Hogg as Chairman of the

ORIENTAL ESTATES CO.,

and which I do not think has been recorded in any of the reports. It was when he referred to his own experience as a sugar plantation proprietor both in British Guiana—a gold currency colony—and in Mauritius with its Indian rupee currency; and to the immense advantage which the use of silver in payment of labour, etc., gave to the latter over Guiana with its gold payments. The Committee appointed to confer with the Directors was to have its first joint sitting on Monday last; and I have no doubt by this time a thoroughly good understanding has been effected: for, it became perfectly clear at the meeting that the Chairman and his fellow directors had acted with the utmost good faith, however strongly "preference" shareholders might object to the course pursued.

TEA, TEA SHARES, AND TEA COMPANIES

have been a good deal before the press and the public during the past week, mainly owing to Sir John Muir's big Company affording the text for a good many articles, some of them rather far-fetched. It was interesting to learn from Mr. C. E. Strachan, during a brief chat, that all the capital required for his

"GALLAHA COMPNAY"

from the public is already over-subscribed —mainly by personal and business friends —before the prospectus has been issued. Mr. Strachan is full of confidence in the future of our tea enterprise; and he has, of course, a very large interest, not only through the Company about to be floated, but in the Ragalla Company, with its high rich plantation, and in valuable tea properties in the Agrapatana, Bogawantalawa, etc. Mr. Strachan, who much enjoyed his recent winter visit to the colony, is looking very well and may go out again during the coming winter. The "tea" acreage in the Gallaha prospectus, I may mention, is valued so moderately as £42 per acre. The Company will hold the Colombo business (with Mr. Hathorn as Manager) and this will probably be much extended.

My letter on

"COFFEE," ETC.

in the London *Times* has been attracting a good deal of attention, mainly through a reprint circulated among Ceylon men and merchants at home. One planting colonist writes:—

"I am much obliged for the reprint of your extremely interesting letter to the *Times* which had escaped my notice. I have felt for some time that coffee is the thing to go in for now, and am myself taking up land in the Selangor District with a view of having another try at the good old staple. I am hoping to go out to Ceylon and the Straits towards the end of this year to have a look round."

It is evident from recent experience that one has to be careful to discriminate among the States and soils of the Malayan peninsula, so far as "coffee" is concerned; but I do trust that some investors—Sir Graeme Elphinstone, for instance—may reap the fruit of their enterprise. On the other hand, the Shiré Highlands in British Central Africa may yet prove the coming Eldorado for coffee: we shall hear more of it shortly, no doubt, when Sir Herbert Johnston arrives home.

MR. THOS. CHRISTY AND THE OVERPRODUCTION OF COFFEE AND INDIAN TEA..

I have also received the following suggestive and interesting letter from Mr. Thos. Christy of Lime Street:—

London, E.C., June 19, 1896.

Dear Sir,—In your lotter to the *Times* of June 1st, you speak of the question of over-production of coffee. The price of coffee appear to be ruled very much by Brazil for quantity and Java for quality. In my opinion, in the future the great coffee-producing country will be Africa, and the reason I think so is this: there are so many indigenous varieties found growing wild in Africa, and crops which would surpass the imagination of those who had seen it, points to the fact that that land is suitable of coffee-growing.

In the same copy of the *Times* was a leaderette on Indian affairs, and speaking about the labour that India can furnish for making railways, I am quite convinced that it will not only be a question of the Indian assisting to make the railways and doing them thoroughly well, and at a low price; but I shall be very much surprised if the Indian once leaves Africa. There is a class of Indians, if I may be allowed to use such a name, who have thoroughly studied in Europe, and also in the schools of India, and some of whom, I believe, you have in Ceylon; these men, in many cases, they are excellent telegraph clerks, excellent post office clerks, who thoroughly understand the routine according to the English system; they are accustomed to hot weather and, from the information I havo obtained, are thoroughly reliable. Although we may be sending English ladies out to India as doctors, there is a large number of native gentlemen who have qualified in this country who would be very suitable to send to Africa, especially to the Soudan, and it will not be long before the attention of merchants in Bombay and Calcutta and also in Ceylon will be turned to the splendid districts which England is reconquering in Africa. It is well-known that the English have no wish to fight; they are merely endeavouring to establish peaceable occupation for the Egyptian and also for their Indian subjects who are now commencing to trade with Africa; so much so is this the case that produce is being sent from the east coast of Africa to Bombay, where it is transhipped to England. Once the Indian leaves the rule of India he will feel that he will have the full protection of the British Government in Egypt and in a very short time you will be able to chronicle the fact of the introduction of Indian houses along the east coast of Africa. Already some of the East Indians are going to France to study French; some are also settling in Germany to thorougly gain the language and the customs of Germany and German trade, with the object of settling in German colonies. They know that they can purchase goods; they know also what the natives require and will very quickly learn the native languages and dialects. Although entirely agreeing with the writer in the *Times* of the 1st June in regard to the labour, still we must not ignore the upper classes in India who have qualified to assist the English in developing our colonies and possessions, especially in hot climates.—I remain, yours truly. Thos. Christy.

That my correspondence is widespread and varied may be judged from the following from the editor of the *Friend*:—

Dear Sir,—I was glad to meet you at the breakfast meeting of the Aborigines Protection Society at Cannon St. Hotel, but had no opportunity to ask you a question on which I want information. Friends want to establish an Industrial Christian Mission on Pemba and we think the best way of helping the coloured people when Mr. Curzon abolishes the legal status of slavery will be to purchase an estate on Pemba and run it with freedmen. This will require a competent business man at the head of it to run it, and we have no such man at present; but I want to know how *copra* is prepared in Ceylon for the Marseilles market. Can you kindly tell me where I can get the information that would practically guide us in placing copra from Pemba in best condition for the market? I understand that at present Ceylon does this the best, and that you have studied the subject. Kindly excuse me for thus troubling you.—Yours very truly,

Henry Stanley Newman.

A copy of our "All about Coconuts" gave Mr. Newman, I trust, all the information he required.

HORNIMAN'S TEA COMPANY.

Talking of Sir Graeme Elphinstone reminds me that I learned from Mr. Horniman, M.P., the other day, that neither "Logie" nor Mr. Powell Jones now holds seats on the Directorate of his great Tea Selling and Distributing Company. Competition in this business must be very keen owing to the multiplication of agencies; and yet I was surprised to learn the other day that a well-known City Firm could allow a grocer-agent in a West of England town as much profit as fourpence a pound off a good tea supplied by them and which was being freely sold and appreciated at the said watering place.—Mr. Horniman evidently thinks it very important a good hold should be got of the American and Russian tea markets to meet the further production of tea. I forget if I told you in a previous letter of a surprising fact learned through a young English lady's letter from

BERLIN,

namely, that she has never seen so much tea drunk as in German families there: as in Australia, the rule seems to be to have tea at every meal. I recently heard of the death at 93 in England of one who had been a great tea drinker all his life—a good evidence of its use!

The question as to whether the pristine

QUALITY OF CEYLON TEA

grown on virgin soil can be maintained is again on the *tapis*. A well-known V. A. of wide experience now at home, is of opinion, such a quality can with proper care and attention be kept up; but he is opposed by the actual experience of several proprietors of first-class properties—notably in Bogawantalawa—who declare that, with no possible falling-off in attention, their teas of the 3rd to 6th years have never been equalled in flavour since, though a good average has been maintained.

NATAL TEA INDUSTRY.

A GREAT FUTURE.

IF PROPERLY WORKED.

Mr. G. W. Drummond, at present at Johannesburg, writes to the *Diggers' News:* The following remarks on the tea industry of Natal may be of some interest to many in Johannesburg who are engaged in the trade, and also to others who may like to know how this particular industry is progressing in the Garden Colony at present. Compared with India, and even with Ceylon, tea growing in Natal may fairly be said to be only in its infancy. The industry dates practically from 1882 Since then, however, it has made great bounds, and particularly so from 1891. There are barely 3,000 acres under plant in the whole Colony—quite small—equal only to the extent of many single estates in British India. Still, there is not a donbt bnt that the industry has a bright future in South Africa. The bulk, the very great bulk, of the yearly out-turn is consumed in Natal itself. Fields further ahead to the south and inland are yet practically untouched, and it now undoubtedly rests with tho planters themselves to make prompt use or not of their present golden opportunity. For Johannesburg, for instance, which is a splendid opening for Natal tea, the growers of Natal are even now, rather late in the field. They do not appear to have tackled the subject properly, so far. Certainly they had difficulties to contend with in not being directly connected by rail until lately; but more could have been done. Another mistake they make, too, is misnaming their teas. Natal golden pekoe, for instance, though a very excellent tea, is not a pekoe (or leafy tea) at all. The same with their flowery pekoe, which is simply a broken pekoe. Teas here are bought for price or by their name, and naturally a grocer or the public accustomed to China and Indian teas looks for something leafy in pekoes of any kind. It would be a very good thing if more tasting before purchase was done in Johannesburg, such as obtains in England. There, every little village grocer will get samples from different houses first, and then buy his tea according to quality. How much Natal tea is consumed in Cape Colony or the Free State? No quantity worth mentioning. But the trade only requires adequate and intelligent pushing to find markets there. Planters must be prepared to spend money if they wish to open up the interior. Indian and Ceylon teas are getting very firmly established in all parts of South Africa, and so are cheap China teas. If Natal wants to compete with the two former, her most dangerous rivals, she must meet them more on the level. She must pick finer. Natal planters say they cannot, couldn't pay, labour too expensive, an so on; but the real fact is, they have never seriously tried. It would have been better for them if, with an estimate of 200,000 lb., they had been content with 150,000 lb. better quality; and in the long run quantity before quality will not do, and will not pay. This has been proved in India over and over again. More friendly competition, too, among the Natal planters would be good for the industry. There are only five estates, altogether which use machinery to make their own teas (*i.e.*, counting the Sprowston estate one with Kearsney), out of which only two are in any large way, and these two, instead of working hand in hand for the benefit of the industry, are perpetually cutting each other's throats by jealous rivalry, for which one is not a whit less to blame than the other. If the industry had received more substantial aid from the Government of Natal at its very commencement, such as the Ceylon planters got, it would probably have been three or four times as large by now, and it would have undoubtedly been so much the better for the Colony. The cost of coolie labour now-a-days is too expensive altogether. But this is a subject which cannot be gone into here. The "whys" and "wherefores" would take too long It would be another good thing for the industry if some of the leading growers would take a trip to, say, Ceylon, and see how they do things there. It is almost quite safe to say that, at present, not a single man engaged in tea planting in Natal has more than the mere local knowledge of his business—no outside experience—and it certainly is to his credit that he has done so well so far. The real tea districts of Natal lies within six miles of Stanger, amid exceedingly pretty scenery and commands a fine view of the sea. As regards the total output of tea from the Colony for the current season, tho result will be below that of last year. In December, 1895, the large central factory at Kearsney was totally destroyed by fire, the with it, at the same time, 100,000lb. tea. Now and stimate for Kearsney alone was 560,000lb., and for ehe whole Colony 960,000lb., so that it can be see t that the bulk of Natal tea is made at the Keuarsney central factory. This estate buys the leaf of 11 small gardens (belonging to separate interests), and manufactures it into tea along with its own leaf. It cannot, after the fire, in which the machinery was lost also, make more than 300,000lb. for the season 1895-96, so that the total crop of Natal tea this season will probably not reach over 700f000lb., or something over 100,000lb. less than last year. Next month, June, will see the close of the present season. Outdoor work will then be the order of the day until September comes round. As Kearsney has got to work again, partially, and will probably be ready for the new season, the output of the colony for 1896-7 ought easily to exceed 1,000,000lb of tea. That would be a gratifying result, and all the friends of Natal will be glad to see the Garden Colony going ahead successfully.

A "SWAGGER" PROSPECTUS.

We cannot congratulate the promoters of the Consolidated Tea and Lands Company, Limited, on the felicity of the title they have selected. What does it mean? Are they going to sell consolidated tea in one department, and deal in land in the other? Or are they going to sell a blend of tea and land with calm disregard of the Adulteration Act? Neither, we understand is the actual object—which is described in the prospectus as follows:—"To take over as going concerns and to amalgamate the estates in India and Ceylon. . . . known as the estates of the North Sylhet Tea Company, Limited, and the South Sylhet Tea Company, Limited. . . . These companies have since their formation in 1882 when worked under the same proprietary as private Companies, and they are now amalgamated and formed into a public company *with a view of securing a quotation onthe London and Glasgow Stock Exchanges.*" This is a very frank admission which does credit to the pretentious board of directors who are going to assume the management of the amalgamated undertakings. It is, however, to be regretted that the same spirit of candour was not extended to giving a statement of the amount of capital of the companies to be acquired. It seems to be a respectable enough promotion, and possibly it may not be intended to let outsiders have much of the capital—all events until the coveted Stock Exchange quotations are obtained.

What strikes us most in the prospectus is the appearance on it, as a director, of Lord Roberts, the Commander-in-Chief of the Forces in Ireland. We beg his lordship's pardon. We ought to have said of;—

Field-Marshal the Right Honourable Lord Roberts of Kandahar and Waterford, G.C.B.; G.C.S.I.; G.C.I.E.; V.C.; D.C.L.; L.L.D.; etc.; Royal Hospital, Dublin.

It is a pity that Lord Roberts had not a few more initials to append to his name and chief title. We were under the impression that it was not good form for a fully-pay officer occupying such a distinguished position to let his name appear as a director of a public company. There is, perhaps, no special reason why he should not, provided that the official duties are not thereby prejudiced any more than that he should devote his leisure time to the management of his private affairs at Kandahar, Waterford, Sylhet, The Royal Hospital, Dublin, or elsewhere. Still, it does strike us as strange, in view of the stringent regulations of Government departments in analogous matters to find Lord Roberts' name in this connection and with his official address. We have not forgotten the outcry there was when a Lord Mayor of London allowed his name to appear on a prospectus and with his official description appended. And surely it is more appropriate for the Lord Mayor of the greatest financial centre in the world to be a director of a public company than for a General, even if he be also a Doctor of Laws and an "etc."

Should there be any warlike operations against the properties of the Consolidated Tea and Lands Company the services of Lord Roberts will be invaluable. In the absence of these we presume that on the other directors will fall, the bulk of the work of conducting the business. By the way, they express their intention of putting a considerable area of the land to be acquired "under coffee" which suggests to us that it would have been a happy idea to call the company the tea, coffee and Land Corporation, Limited. Undoubtedly all concerned with the company are of high business standing from the directors downwards. The firm of Finlay Muir and Company of Calcutta who have managed the business since its formation have agreed to continue to do so, though the period of the agreement is not stated, and during its tenure to hold shares to the round value of £200,000, of which at least one-half shall be in Ordinary shares. What chiefly perplexes us about this prospectus is whether it is really intended as an invitation to the public or not. The reference to the object of obtaining Stock Exchange quotations, the short time allowed for the offer of capital, and the general family-party appearance of the document, suggest that the public offer is more or less *pro forma*; though, perhaps, some of the ordinary capital—the proceeds of which are to be devoted to the purchase and development of land, and is to be called up over a period of five years—may be given to outsiders.—*City Leader*, June 20.

INDIAN TEA COMPANIES.

The appearance of the Consolidated Tea and Lands Company brings into prominence once more a class of investment which scarcely receives the attention it deserves. Taken all round, Indian tea companies show results with which shareholders have no reason to be dissatisfied, and their success is evidenced by the number of new companies registered in London during recent years. It is a little surprising, therefore, that out of a list of 75 of these under-takings which we have before us only 13 are quoted in the Official List, while the prices of the remainder, being unknown to the tape, can only be discovered by special inquiries. A partial explanation is to be found, no doubt, in the fact that the capital of many of these companies was privately subscribed, and that the proprietors have been content to hold their shares as an investment, without caring for the advantages of public quotations. It is obvious, however, in cases where realisation is necessary, that a free market ensures not only the finding of a purchaser, but also the certainty of obtaining a fair price, and it is apparently with the object of securing a quotation on the London and Glasgow Stock Exchanges that the North and South Sylhet Tea Companies are being converted and amalgamated into the Consolidated Tea and Lands Company. At first sight the capital of the new company appears rather large, since, as far as can be ascertained, the paid-up capital of the two amalgamating concerns is only £462,000, while the purchase price to be now paid is £1,600,000! We imagine, however, that there must be loans of a large amount in addition, because the prospectus states that the cost price of the estates stands in the companies' books at £1,446,000. While it is not our purpose to discuss the merits of the new undertaking, it may be of interest to take the North and South Sylhet Companies as a starting point, and how to show the rapid progress which has been made, especially as they are even now by far the largest producers of Indian tea.

Their estates cover an area of 170,000 acres in Assam, Sylhet, the Dooars, Darjeeling, and North Travancore Hills, besides about 10,000 acres in Ceylon. On November 30, 1895, there were 21,310 acres with tea in bearing and 5,439 acres planted with young tea, coffee, and cocoa; while since then another 4,371 acres have been cleared and are in course of planting; so that the whole area under cultivation is now 31,120 acres. How greatly in excess these figures are of the acreage of any other limited company will be evident when we mention that next in order comes the Assam Company, which has about 10,000 acres under cultivation, while the Land Mortgage Bank of India has 8,000 acres, the Jokai (Assam) Company 7,300 acres, and the Dooars Tea Company 6,120 acres. After these we drop to 5,000 acres on the Jorehaut property and then we find a number of companies such as the Assam Frontier, Chargola, Lungla, Singlo, and Brahmapootra, where the cultivated area varies from 3,000 to 4,000 acres. As regards production, the combined North and South Sylhet Companies raised 9,583,734 lb. in 1895, against 5,678,379 lb. in 1888, and the 1896 crop is estimated at 10,070,000 lb. of tea. Bearing in mind that they have 150,000 acres of land still uncultivated, of which 90,000 acres are in the North Travancore Hills, from which exceptionally good results are expected, there cannot be two opinions of the great possiblities that lie before the amalgamated undertaking. At present the largest crops for 1895, of the other companies that have so far been actually reported are 3,108,671 lb. on the Jokai (Assam) estates and 3,017,000 lb. on the Dooars property. These amounts will probably be exceeded by the Assam Company, where the crop is estimated at about 3,300,000 lb., and then there is a drop to 2,400,000 lb. on the Assam Frontier Company's estates, and an estimated outturn of 2,143,000 lb. by the Brahmapootra Company.

We need hardly say that the amount of the crop is not necessarily an indication of a company's prosperity, nor of the desirability of its shares as an investment. The relation which the outturn bears to the acreage under cultivation must be considered, as also the quality of the leaf, and, above all, there is the important question of capitalisation. For instances the Brahmapootra yield of 2,143,000 lb. from 3,390 acres is better than 2,423,000 lb. from 4,085 acres on the Assam Frontier property; while, as the capital of the former is only £114,500 in £5 shares, against the £330,000 (including debentures) of the latter, there is clearly much larger scope for dividends on Brahmapootra shares. In fact, the average dividend on these shares for the six years from 1889 to 1894 inclusive, has been 17½ per cent., against 6 per cent. on the Ordinary shares of the Assam Frontier Company. For 1895 the final dividend has not yet been declared by the Brahmapootra Company; but the interim dividend was 8 per cent., as in the previous year, and there seems every likelihood of the total distribution coming to 20 per cent., as in 1894. The directors of the Assam Frontier Company have already declared 6 per cent., for the past year, which we may observe, is just double what the Ordinary shares received in 1891. Among the other companies that have announced their dividends may be mentioned the British Indian Tea Company with 5 per cent., as against 6 per cent. a year ago, Darjeeling 5½ per cent.

Dooars 12½ per cent., Jhanzie 10 per cent., Jokai (Assam) 10 per cent., Moabund 15 per cent., Noakacharec 5 per cent., all of which are the same as in 1894; while the Doom Dooma dividend of 10 per cent. is 1¾ per cent. less, and the Lebong and Majuli distributions of 13 per cent. and 5 per cent. are 2 per cent. smaller in each case. The two Sylhet companies have paid an average dividend of 10 per cent. for the last seven years, and for the same period the average dividend on Doom Dooma shares has been over 11½ per cent., on Dooars 11 per cent., Jhanzie 9¾ per cent., and on Jokai 10 per cent. The shares of the last-named company are quoted at £18 for the £10 share; so that they yield £5 11s per cent., which is not a bad return for a sound undertaking which has paid 10 per cent. every year since 1885, and has a reserve of £43,808. The yield on Dooars shares at the current price of 20 is just 6¼ per cent., and this company also has a satisfactory reserve of £40,000. At 18½ Doom Dooma returns £5 8s per cent., and, on the basis of last year, Jorehaut and Assam shares can be bought to pay 6½ per cent., both the two latter having also substantial reserve funds, while the Lungla and Singlo Companies, which have only recently been established, can be purchased on still more advantageous terms. There are many other companies with equally good prospects—we have merely taken at haphazard a few of those which are best known over here—but we have said enough to show readers who have time to study the position of Indian tea companies that they may be able to find not a few desirable investments among them.—*Financial News*, June 20.

THE PRINCIPAL DISEASES OF CITROUS FRUITS.

We have been favoured with a copy of Bulletin No 8 from the U. S. Department of Agriculture, which contains a very interesting treatise on the principal diseases of citrous fruits in Florida, beautifully illustrated with coloured plates showing the various blights and their effects, such as "Die-back" or *Exanthema*, "Scale," *Verrucosis*, "Foot-rot," "Sooty mould" &c. the last following the mealy wing or white fly, *Aleyrodes citri*, from all of which it appears that frost is by no means the only enemy Florida has to fight.

The writers would seem to make a mistake in supposing that the "die-back" is peculiar to Florida or that it is "not known in any other part of the world." In Ceylon we are not strangers to the "die-back" disease on orange trees with all its accompanying characteristics,—first the unusually large foliage, followed by the dead tips, the scaly eruptions which seems invariably present, the sickly yellow colour of fruit and reddish-brown stains thereon. The results are disastrous enough to the fruit-bearing capabilities of the trees; but inasmuch as we, in Ceylon, place very little commercial value upon our orange its enemies have received less of our attention. There are however a few grains of comfort in these admirably written pages which will commend themselves to all interested in the culture of this most refreshingly wholesome and delicious of fruits. Not content—like too many scientific men—with elaborately and minutely describing the life-history of the enemies of the citrous family, they carefully trace the causes, suggest preventive measures, and in plain terms prescribe effectual treatment. It is, we believe, generally felt that scientists are rather too apt—like Dr. Watt on white-ants—to treat us to learned and laboured dissertations on the life of such enemies of the husbandman as if there was any doubt about their existence! omitting altogether what we stand most in need of, viz., some suggestions as to their effectual and speedy destruction. A man half poisoned with strychnine cares little to be told to what ancient family *nux vomica* belongs. It's an *antidote* he wants. Life is short, and few farmers or planters in this work-a-day world have time to follow the philosopher in all his leisurely researches. They may be learned, they may be interesting, and still the practical result be nil. In this respect the writers—Messrs. Swingle and Webber—on vegetable physiology in the United States Department of Agriculture show an excellent example. The information is brief and to the point, they diagnose the diseases of trees as a doctor does that of a patient, and prescribe accordingly.

We need only quote one sample. The treatment of "die-back"—after concisely stating the causes and various symptoms—is thus recommended:—"When die-back is due to excessive use of highly nitrogenous organic fertilizers, an effective remedy consists in simply ceasing to cultivate. In fertilizing omit entirely all highly nitrogenous organic manures but use about the normal quantity of potash and phosphoric acid. As the tree recovers a small amount of nitrogen should be given, preferably in the form of nitrate of soda or sulphate of ammonia, until the tree is brought up to its normal condition. If the disease is produced by the close proximity of privies, chicken houses, &c. removing these will usually result in the recovery of the affected trees. When the malady is caused by planting on die-back lands treatments vary according to the character of the soil. Thorough drainage will usually be found an effective remedy without any other treatment. If the soil is underlaid with hard pan, mulching the trees with pine straw-oak leaves or something of this nature will allow the feeding roots to develop near the surface and usually bring about a cure. The latter has been found effective in many instances. Similar instructions are given with regard to "foot rot," "melanose" and "scoty mold." In the case of each disease discussed we have not only preventive measures suggested but the most practical means of combating it when it does appear.

The orange industry in Florida and the West Indian islands is of prime importance. In Florida alone no less than $50,000,000 has been invested in the business, while fully 20,000 people are dependent upon it for support. Here in Ceylon it has hitherto been of little commercial value. Growers complain that there is no real market for such produce, notwithstanding the number of calling ships and the eagerness with which passengers appreciate good fruit. The dubashes somehow contrive to supply such rubbish that a very bad impression is given of the capabilities of our fruitful isle.

VARIOUS PLANTING NOTES.

The Price of Wynaad Tea continues to rule high, says a Madras contemporary. The latest sale, 27 half-chests from the Kanambyle estate in the Cherambady District, realised an average of 10½d, being on an average about 2d above Ceylon marks sold that week. We have still to learn what is the annual yield per acre of these young tea clearings, but if it is anything like the amount anticipated, the success of the Wynaad as a tea country will be assured. But then we shall probably be told it is too wet for tea—a planter cannot wither properly with 18 inches of rain a day, an argument that would have all the merits of those adduced to prove the district was too malarious for the cultivation.

The Preparation of China Tea: Another Commission to India Proposed.—In the *North-China Herald* of June 12 is printed the following note from the June number of the *Messenger*:—

Tea Culture.—The Board of Revenue has been addressed by a eunuch Lieu and by Chen, a senior secretary, on the importance of sending a commission to India to examine the methods of preparing tea for the European market there in use. They also propose the establishment of a technical school of instruction in tea manipulation. Workmen would here be informed what to aim at and what to avoid. It is to be hoped that China will soon become fully awake to the need of close attention to tea culture. We do not expect that the proposals will be acted upon, seeing that the outcome of the former commission appears to have been *nil*.

Correspondence.

To the Editor.

MANURE FOR JAK TREES.

Carambogam Estate, Pallai, N.P., June 17.

Dear Sir,—Could you kindly find out for me through your valuable paper a good manure for jak trees.—Yours truly, H. J. M. T.

CEYLON TEA IN CANADA.

25, Front St. East, Toronto, June 22.

Dear Sir,—In your issue of May 16th, you publish, amongst the interesting list of contents, "Ten Thousand Pounds of Tea for Canada," and in your news column, page 494, are the particulars of this export, as a portion of the cargo shipped per steamship "City of Agra," namely "For Montreal, Tea, 10,669 lb." We presume, since you gave prominence to this fact by the headlines above quoted, that it was intended that your readers interested in the export of Ceylon Tea should read with gratification, that such a large amount as 10,000 lb. has been exported on one steamer to Canada direct; but surely instances of several times this quantity being shipped to Canada direct are taking place with almost every opportunity, of vessels leaving for London.

In proof of this, we shall draw your attention to the figures published in a circular issued by Messrs. Gow. Wilson & Stanton, of London, dated February 21st, in which they report "Re-exports of Ceylon Tea, United Kingdom to Canada, 1,113,165 lb. for 1895; as against 613,817 lb. for 1892, and Trans-shipments United Kingdom to Canada as 255,408 lb. for 1895, as against 13,330 lb. for 1892."

The direct exports Ceylon to North America are given as 714,958 lb. in 1895, as against 204,891 lb. in 1892, and as Canada takes a considerable portion (about half) of such direct exports to North America, and as Canada is now more than ever importing its supply of Ceylon Teas direct from Ceylon, and as the business, under judicious advertising, is rapidly increasing, as the figures above quoted indicate,—it must be so, that large quantities of tea are being shipped every week from Ceylon to Canada.

We ourselves are constantly receiving direct from Ceylon, in much larger quantities, and it would be interesting to know, if you have the means of looking up, the quantity of Ceylon Tea shipped direct to Toronto on through bills of lading. Having taken a very active part in the development of the sale of Ceylon Tea in Canada, we are naturally desirous that people in your country who take any interest in this matter should not arrive at the wrong conclusion that 10,000 tea exported to Canada can be looked upon as an item of interest, when, as a matter of fact, we should think, from the figures above quoted, and from our knowledge of the trend of business in Ceylon teas, that a low estimate of the present direct exports to Canada would be at the rate of half a million pounds per year, because it must be borne in mind that the 255,000 pounds quoted as trans-shipments United Kingdom to Canada are to all intents and purposes, and as a matter of fact, direct purchases in Ceylon, for Canada account; teas being shipped to London, to be trans-shipped there to destination in Canada.—Yours respectfully,

SALADA CEYLON TEA COMPANY,
P. C. Larkin & Co.

NATAL TEA.

London, E.C. June 25.

Sir,—My old friend Mr. Peter France who has done so much towards the advancement of South Africa has been moved from Port Elizabeth to the Cape Town office of the African R. Mail Steamship Company. He sends me a cutting from the *S. African Telegraph* respecting Natal tea. I have tested this tea and it contains a good amount of theine or caffeine, showing it is far better to drink than the mixtures that used to be shipped from Hamburg to South Africa.—Yours truly,

THOS. CHRISTY.

[The cutting appears on page 126 —Ed. *T.A.*]

THE FASTENING OF TEA CHESTS.

26 Mincing Lane, London, June 26.

Sir,—I think it will interest you to learn that I have now perfected a nail or clamp for securing lids to tea chests so that the lids can be lifted off without damage to the package and thus leave it a usable and saleable article for repacking or otherwise. As at present the packages from Ceylon are very little used, after inspection it is always necessary to open them for the brokers, and sometimes they are again opened for sampling whilst a large proportion are exported with landed teas in them to foreign markets, thus it is an evident advantage to make the opening and closing of the tea packages as simple as practicable. My chests are made of inodorous white wood, dovetailed, grooved and tongued, are rather lighter than the momi packages and about the same price. I am making occasional shipments to Ceylon and India, and find that the trade buys readily, as the grocer here has a sale for a package which can easily be converted into a flour bin, or other useful and domestic furniture, while he finds the iron and hard wood packages are only in his way.—Yours truly, ED. AMES.

THE PRICE OF CINNAMON.

Magdalene House, Negombo, June 26.

Dear Sir,—In your paper of 24th instant writing about the last cinnamon sales, you say:— "A.S. G.P. (Golua Pokuna) at the sale on the 1st instant, did not command a higher price for its firsts than 1s 4d." *Quite correct.* "The next highest prices realized were for spice from W.S. and K. from the well-known F S. Kadirane group, and these fetched up to 13d."

This, I beg to point out, is not correct, as my 1st quality cinnamon, under two different marks, was also sold at 13d and more, one small lot of Hora Hena Estate being sold even at 14d, and these too, in the same catalogue of the brokers Messrs. James Cook & Co. in which the sales of "Golua Pokuna," W.S. and K. appear.—Yours faithfully,

J. DE S. RAJAPAKSE.

FRUIT PACKING.

Dear Sir,—I see that it has been discovered by a California fruit-grower that when fruit is packed in powdered borax it resists decay for months. I should wish to know, if this system of packing has been tried by anyone, and if it has been really successful.—Yours truly, GARDENER.

EXTENT OF CINNAMON GARDENS IN CEYLON.

Dear Sir,—Amongst the "General Gatherings" (a most interesting column) in the *Weekly Budget* it is stated:—"The cinnamon gardens of Ceylon are said to have an area of 12,000 acres." But I always thought that it was a great deal more. Who can give the correct extent?—Yours truly,

CINNAMON PLANTER.

[According to the Ceylon Blue Book for 1894 (the latest published) the area under cinnamon is 39,816 acres; but this is only approximate.—Ed. *T. A.*]

PURE CEYLON TEA.

Billiter House, London, July 1.

Dear Sir,—"How to secure pure Ceylon Tea being sold in England" is the text of "a gentleman interested in the Home tea trade" whose Incubrations are given, if not in full, at all events in sufficient length, in the *Overland Observer*, under date May 21 of this year.

The first thing that strikes one is, that though "England" is the country to be converted from a belief in "delicious Mazawattee" and Lipton's "best tea in the world for 1/7" and such like blends of "Far Cathay" with Lanka's sole, Scotland is the division to be first operated upon, and Glasgow the first city in which the proposed experiment is to be tested by some lusty youths, presumably in hilts as they will have to mount many stairs, and will need all the freedom of limb possible to overcome the much climbing to be encountered in the four months' siege of the denizens of St. Mungo.

The next thing that occurs is, if "pure Ceylon" in the City of Lipton, the great producer of the article, has to be sought for with such care and forebodings that salvation for England cannot be expected from these, why not try the great cosmopolitan Metropolis, and perhaps a virtuous few might be found amongst the adulterating many of the modern Sodom, who, if separated from the wicked, by the imprimatur of the Ceylon Association of London, might eventually so commend the pure article as to leaven the whole lump, more or less—but rather less it is to be feared.

It is only to be expected that Ceylon Tea, like all other articles in great demand, and capable of adulteration, will be adulterated, and nothing that can be suggested outside a stringent penal act of Parliament, will prevent Ceylon Tea being used to fortify and work off cheap Chinas, and other tea rubbish of many lands.

Old planters and others interested in the genuine article being sold in its purity may speculate as much as they like on measures to prevent adulteration, and palming off spurious and inferior mixtures in place of pure Ceylon teas, but the best prevention is for the dealers in only the real leaf of the Spicy Isle to combine and advertise themselves as under the guarantee of the Ceylon Association of London to sell only the teas imported direct from Ceylon.

Whatever might be done in Glasgow under the direction of the "gentleman interested in the home tea trade" by the use of a map and the services of a dozen kilted lads, spurred on to storm the many winding stairs by the quickening strains of Scotia's martial pipes, it is certain that other and milder means must be found for the conversion of the brutal Saxon to take his tea, as it is hoped he takes his beer pure and unadulterated.

If the correspondent of the *Observer* believes earnestly in his plan of campaign I feel sure the Planters' Association would be only too glad to see him put it in operation—of course at his own expense —and surely one largely interested in the home trade and perhaps in Glasgow as well—can hardly expect the Planters' Association to do more than give him their best wishes and a blessing into the bargain.

Much of the Indian tea may be all that the "gentleman interested in the home trade" says it is, but we have only his word for it that the sale of "Ceylon" is being injured by the blending that may be going on with "Indian." So long as it is blended with Indian only, there is probably no damage done, but the contrary, for if much of the Indian tea can be put on the retail market only after being fortified by Ceylon tea, it is a testimonial to the latter, and a guarantee that its virtue will be rewarded by a constant demand from its great neighbour for the further support of the increasing millions that will be sent from it to the world's great market in London.

When we consider the annual increase in the consumption of tea, that Ceylon will probably never go much beyond the hundred millions, and that China is going down as India is going up, why should we, as suggested, initiate a crusade against the Indian with which we are now, to our mutual advantage, in America, running in double harness, and should be doing the same in Russia, and other countries yet to be conquered?

The last thing I should hope the Planters' Association of Ceylon, or Chamber of Commerce of Colombo, will do, will be to countenance anything to disparage Indian teas: they may not be as good as Ceylon, but that does not affect the latter, so long as it finds a market. If the Indian is not so good, so much the better for Ceylon, and why therefore go out of our way to proclaim what—if it is a truth —will show itself soon enough for Ceylon, and much too soon for India.

It may be true that Ceylon had a great share in ousting China, but she could not have done it, however good the quality, without India, neither can the balance left of the production of the celestials be wiped out without India. Together have they conquered, and only together can they advance to greater victories.

China is not dead yet, nor Li-Hung Chang either, and we cannot tell what effort may be made in the immediate future to resuscitate the production and trade in tea from the Flowery Land. Before going to war with India let us first drive out what remains of China, and, when that is done, we shall in all probability find there will be less cry of adulteration, and less need of measures to prevent what can only be a blending of varying qualities of the same leaf, similarly prepared in the two countries. —Yours faithfully, JOHN TYNDALL.

Mr John Ferguson, of the *Ceylon Observer and Tropical Agriculturist*, has an interesting article in the *Times* of June 1st on the subject of "The Production of Tea and Coffee in British Dependencies." Few men know as much on this subject as Mr. Ferguson, and we regret that want of space forbids us from quoting at length from his letter. He points out, among other things, that the export of tea from India has steadily risen, year by year, from 2¼ million pounds in 1861-62, until the estimate for 1896-97 is 144 million pounds. In Ceylon the export of tea 23 years ago was 23 lb. only, while for 1896 the official estimate of the total export is 102 million pounds. Verily tea has done much for Ceylon's lovely isle.—*Colonies and India*, June 6.

Coffee in B. C. Africa.—Says the *Central African Planter* for June:—

We have at last been favoured with the statistics of last season's export of coffee and it is gratifying to find that the figures completely bear out the estimate published in these pages some nine months ago, viz. 150 tons. The actual quantity exported was 146 tons exactly double the export of the previous year. In addition to the actual quantity exported we have to consider the amount obtained in this country for home consumption and the amount used as seed. As 1 cwt. is by no means a large amount for seed purposes and as the number of separate plantations exceeds 100 the amount used for seed alone would be considerably in excess of 5 tons that it is certain that the actual crop exceeded 150 tons. Taking the usual calculation of £100 per ton the report shows a gross value of £41,600, the most of which goes to the benefit of this country. It however represents only a small fraction of the amount annually expended by planters in this country as of course most of the recent clearings do not come into bearing till 1897. It is to be hoped that the fore cast for this year's out-put, viz., 300 tons will be abundantly verified and thus continue the geometrical progression of the last five years.

DEAFNESS. An essay describing a really genuine Cure for Deafness, Ringing in Ears, &c., no matter how severe or long-standing, will be sent post free.—Artificial Eardrums and similar appliances entirely superseded. Address THOMAS KEMPE, Victoria Chambers, 19, Southampton Buildings, Holborn; London.

VARIOUS PLANTING NOTES.

ORCHIDS AND ANTS.—It has been observed, says *Public Opinion*, that orchids derive some benefit from the numerous ants which overrun them in the tropics, but the precise nature of the service has remained a mystery. According to a naturalist of the Botanic Gardens in Trinidad, the ants appear to foster the growth of a fungus on the roots of the orchid, and this fungus acts as an additional source of nourishment to the plant. Certain South American ants are known to cultivate fungi for their own use, and these may unconsciously sow the seed of the fungi in crawling over the roots of the orchid. Quite recently, we may add, a variety of these fungus farming ants was found in the neighbourhood of Washington, United States.

THE PLANTING INDUSTRY IN COORG.—In the course of an editorial on this subject the *Madras Mail* says:—The little Province of Coorg may be likened in many ways to the Colony of Ceylon. Not only are its interests identified with the planting industry, but the planters are themselves most enterprising; and nowhere else in Southern India is there such a large continuous area of European cultivation as in South Coorg, where it is possible for a man to ride for more than twenty miles with coffee on either hand. In Ceylon of course nowadays the cultivation is almost all tea. It is no wonder that Mr. Lee Warner wrote strongly in favour of Local Self-Government in Coorg. There is so much wisdom in this recommendation that we trust it will not be lost sight of. Coffee has been doing remarkably well in Coorg during the past few years, and it is largely to this fact that there has been such a great expansion in revenue. This surplus revenue at the end of 1894-95 was the largest ever collected in the Province viz., R3,53,496-9 5, and the total revenue the highest, viz., R9,62,935-9-7. The increase in revenue from coffee is 21·21 per cent., partly due to the vigilance of the Land Record Department. These figures are in themselves an eloquent appeal for a more generous mode of administration. What are chiefly needed are new roads, increased allotments to the P.W.D., an Assistant Superintendent of Police, and railway extension, or, omitting the policeman, the urgent wants of the Province are confined to one thing—improved communications. It has been remarked that it seems "as if the interests of the Indian Government are so vast and varied that it is unable to give the same attention to European interests that is given by smaller and more self-centred Governments, such as that of Ceylon." In the little Province of Coorg, at any rate, it might reasonably be expected to be otherwise, for there is no mistaking the great benefits which European enterprise has conferred, or which it might still further confer, if only it were given a reasonable chance of development. It must, however, be observed that though the coffee industry in Coorg has been built up by European enterprise, at this time there are not a few Coorg gentlemen engaged in it, and it is a source of wealth to the whole population.

CLOSETS, Urinals, Night Commodes, Stables, Kennels, &c. should be lightly dredged (after cleansing) with CALVERT'S 15 per cent. CARBOLIC POWDER, to destroy bad odours and to kill or keep away insects.—The most effective preparation.—In ½ lb., 1 lb. and 2lb: dredgers, at 6d., 1s, & 1s. 6d. each, from Chemists and Stores.
F. C. CALVERT & Co., Manchester.

INDIAN TEA SALES.

(From *William Moran & Co.'s Market Report.*)

CALCUTTA, July 12st, 1896.

TEA.—Since our last, auctions on the 9th and 16th instants, have comprised 32,395 packages, of which 31 961 were sold. The quality offered has shown some improvement, especially on Assam growths: Darjeelings, however, are still wanting in flavour. Prices for the common grades have been a shade easier, but for other descriptions the market has been fairly steady.

Total quantity of Tea passed through Calcutta from 1st April to 18th July.

	1896.	1895.	1894.
Great Britain ..	19,951,958	21,744,482	18,142,367
Foreign Europe ..	87,749	71,033	38,720
America ..	53,045	55,940	43,170
Asia ..	488,136	581,412	348,271
Australia and New Zealand ..	905,291	988,846	845,124
	21,486,179	23,441,713	19,418,102

DRUG REPORT.

(From the *Chemist and Druggist.*)

London, July 9th.

CUBEBS.—Quite neglected and easier. A parcel of fair quality was cleared some time ago at 32s 6d per cwt., and since then importers have been asking from 37s 6d to 40s for fine shifted Si gapore. At that price, however, they have found it impossible to make progress. At today's auctions 31 packages fair brown berries, not stalky, from Bombay were bought in at 35s, a bid of 32s being refused. Another lot of 65 bags very small and dusty ordinary barries from Singapore sold without reserve, at from 19s 6d, rising to 22nd for sound, and 20s 6d for damaged quality.

CUTTLE-FISH.—A parcel of fair pale, slightly discoloured, mixed medium to bold quality sold cheaply at from 2¾d to 3½d per lb. Another lot of 50 bags broken cuttle-fish bone from Penang was bought in.

OILS (Essential).—Lemongrass oil quiet, at 2½d per oz. on the spot, and 1 15-16d. per oz. c. i. f. At auction 27 cases Coch'n oil were bought in at 2⅜d per oz. Citronella oil is tending easier still: on the spot the quotation is 1s 6d per lb. in drums, and 1s 4d per lb. in tins; for arrival it is 1s 2d per lb. c. i. f. in drums.

VARIOUS DRUGS.—A parcel was bought in at 1s 1d per lb. today. 100 bags Cocculus indicus were bought in at 8s 6d per cwt. Of Coca-leaves, a large supply of 159 bales recently arrived was shown. Good Huanoco were bought in at 1s 1d per lb.; for good Truxillo character at from 7d to 1s per lb

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TEA SEED CARRYING COFFEE LEAF DISEASE!—The *Central African Planter* for May has the following alarmist note:—

We are informed by a Mlanje correspondent that the Nyasaland Coffee Company, Ld., is importing tea-seed from Ceylon and it is stated that a permit has been obtained allowing the seed to enter B.C.A. at Chiromo. From what our correspondent says it is propable that, by this time, the consignment has already passed Chiromo. The Mlanje planters—Messrs. Moir, Bradshaw, Brown, Simpson, C x and Austen have, with commendable promptitude, already protested to H. M. Commissioner against the importation and we sincerely hope that C. M. Cammissioner will rigidly enforce the present Regulations for preventing the introduction of Coffee-leaf disease into B. A. C. Ceylon already has the notoriety of introducing leaf-disease into Fiji and German East Africa but it is to be hoped that our connection with the spicy Isle will not result in settling the dreaded fungus amongst us. If such a catastrophe is to be averted we will have to be doubly cautious in all importations from Ceylon the more so in the case of tea-seed as Coffee and tea are grown in the closest proximity there. We should think this is a question for the Chamber of Agriculture and Commerce to notice and it would be gratifying to hear that the standing Committee are moving in the matter. We are fain to hope that the importation has not reached the stage our correspondent suggests because were it so it would be a grave breach of faith on the part of the Administration towards the planting Community.

COLOMBO PRICE CURRENT.

(*Furnished by the Chamber of Commerce*).
Colombo, Aug. 4th, 1896.

Exchange on London: Closing Rates, *Bank Selling Rates*:—On demand 1/2 7-32; 4 months' sight 1/2 ¼; 6 months' sight 1/2 9-32. *Bank Buying Rates*:—Credits 3 months' sight 1/2⅜ 6 months' sight 1/2 13-32. Docts. 3 months' sight 1/2 13-32; 6 months' sight 1/2 7-16.

Coffee.—Plantation Estate Parchment on the spot per bus., R17·50 to 18·00 Scarce. Estate Crops in Parchment, delivery no quot. Plantation Estate Coffee, f.o.b. on the spot per cwt, R86·50. to 92·00 Scarce. Liberian parchment on the spot per bushel R12·50 Scarce. Native Coffee f.o.b. per cwt. R76·00. to 78·00 Scarce.

Tea.—Average Prices ruling during the week: Broken Pekoe, per lb 50c. Pekoe per lb 45c. Pekoe Souchong, per lb 34c Broken mixed and Dust, per lb 27c.—Averages of Wednesday's sale.

Cinchona Bark.—Per unit of Sulphate of Quinine, per lb 01½c. to 03½c. 1 to 3 %.

Cardamoms.—per lb R1·50 to 2·00.

Coconut Oil.—Mill oil per cwt. R14·50.

Dealer's oil per cwt. R14·00 to 14·12½. Coconut oil in ordinary packages f.o.b. per ton. R310*·00 to 320†·00. *October delivery. †Ready in hhds.

Copra.—Per candy of 560 lb R38·00 to 47·00

Coconut Cake: (Poonac) f.o.b. per ton, R55 to 65.

Cocoa.—Unpicked and undried, per cwt. R29 to 37.

Coir Yarn.—Nos. 1 to 8 { Kogalla per cwt. R9 to 18. Colombo „ R7 to 14.

Cinnamon.—Nos. 1 & 2 only f.o.b. 66c. to 66c.

Ordinary Assortment, per lb 62c. to 62c.

Ebony: per ton.—Govt. sales on Aug. 13th.

Plumbago:—Large Lumps per ton, R150 to 330.

Ordinary Lumps per ton, R130 to 290.

Chips per ton, R80 to 140. Dust per ton, R30 to 90 Better demand for fine qualities.

Rice.—Soolye per bag, R7·35 to R8·65.

Pegu and Calcutta Calunda per bag R8 25 to R8·50.

Coast Calunda per bushel, R3·03 to R3·25.

Muttusamba per bushel, R3·10 to R3·65.

Kadappa and Kuruwe per bushel—No quotations.

Rangoon Raw 3 bushel bag R9·00.

Freights.

Cargo.	Per ton London per str. s. d.	N. York per str. s. d.	Trieste per str. s. d.	Mar'lles per str. s. d.	*Hamb', Bremen &c. s. d.
Tea	10/	..	15/	25/	..
Coconut Oil	10/	..	15/	..	..
Plumbago	10/	..	15/	..	..
Coconuts in bags	10/	..	15/	..	..
Other Cargo	10/	..	15/	15/	..
Broken Stowage	7/6	..	..	..	..
SAILERS.					
Coconut Oil	..	28/9	..	..	..
Plumbago	..	27/6	..	..	..

New York rates per steamer with transhipment 12/6 @ 15/ above London rates:—10/ Hamburg; 7/6 Antwerp; 12/6 Genoa.

LOCAL MARKET.

By Mr. A. M. Chittambalam, 7, Baillie St., Fort.
Colombo, Aug. 5th, 1896.

Garden Parchment :— Scarce per bushel
Chetty do :— do do
Native Coffee :— 71·00 to 72·00 per cwt
do f.o.b. :— 76·00 to 77·00 do
Liberian Parchment, 12·50 per bushel (nominal)
do Coffee, 63·00 to 64·00 per cwt
Cardamoms.— 2·00 to 2·75 per lb (nominal)
Cocoa.—(nominal) 32·00 to 40·00 per cwt do
Rice.—Market Steady:—
Kazla R6·75 to 7·25 per bag
Soolye 7·50 to 8·50 do
Callunda Scarce 8·25 to 8·50
Coast Callunda 3·00 to 3·25 per bushel
Kuruve (Scarce)
Muttusamba 3·25 to 3·50 do
Cinnamon.—Quoted Nos. 1 to 4, at 63c and Nos. 1 and 2 a 66 cents per lb (nominal)

Chips.—R75·00 per candy (nominal)
Coconuts.—Ordinary R38·00 to 42·00 per 1,000 (nominal)
do Selected 43·00 to 45·00 do do
Coconut Oil.— 14·00 to 14·25 per cwt do
Copra.—Mark Steady:—
Kalpitiya R45·50 to 46·00 per candy
Marawila 44·00 to 45·00 do
Cart Copra 39·00 to 42·00 do
Poonac.—Gingelly 77·50 to 85·00 per ton
Chekku 75·00 to 80·00 do
Mill (retail) 65·00 to 75·00 do
Ebony.—quotations at R100 to R185 (nominal)
Satinwood. | cubic feet 2·00 to 2·25 do
Halmilla.— do 1·25 to 1·50 do
Kitul Fibre.—Quoted at R28·00 per cwt (nominal)
Palmyra Fibre.—Quoted nominally:—
Jaffna Black.—Cleaned (Scarce)
do Mixed R18·50 to 19·00 per cwt.
Indian do R7·00 to 9·00 do
Do Cleaned 10·00 to 14·00
Sapan Wood.—Quoted 55·00 to 60·00 per ton
Kerosine Oil—American 7·50 to 7·55 per case
do Russian 3·39 to 3·44 per tin
Kapok.—Cleaned f. o.b :— R26·00 to 28·00
do Uncleaned (new) 5·50 to 5·75 per cwt
Croton Seed 13·00 to 17·00 do
Nux. Vnomica 2·50 to 3·00 per cwt

CEYLON EXPORTS AND DISTRIBUTION

1895-1896.

COUNTRIES.	Coffee cwt. Plantation	Coffee cwt. N'tive	Coffee cwt. Total.	Cinchona. 1896 B'nch & Trunk lb	Tea 1896 lb.	Tea 1895 lb.	Cocoa cwt.	C'moms lb.	Cinnamon. Bales lb.	Cinnamon. Chips lb.	Coconut Oil 1896 cwt.	Coconut Oil 1895 cwt.	P'bgo. 1896 cwt.
To United Kingdom ..	9033	5	9038	617136	59144768	54467746	21411	70650	452212	157660	37119	62686	74472
„ Austria	487	..	487	..	29604	2473	97	..	5300	80300	14806	12281	..
„ Belgium	27	..	27	..	20617	4206	82	2000	41900	66188	1919	2700	7814
„ France	459	..	459	..	41508	24036	335	3000	34900	3500	114	.	2005
„ Germany	553	6	559	..	57897	170631	886	32216	212701	83622	5980	10236	17744
„ Holland	..	..	..	..	3889	10781	..	..	..	..	400	..	501
„ Italy	6	..	6	4188	6777	4773	6	..	55200	48608	506	401	264
„ Russia	59	..	59	..	165657	146418	..	..	..	..	26	..	21
„ Spain	..	..	..	..	30300	29675	..	..	144830	8120	208	..	..
„ Sweden	52	..	52	..	1500	750	..	..	299	112	402	..	195
„ Turkey	..	..	..	..	10892	7367	..	..	..	..	.	..	..
„ India	221	..	221	1379	608203	593349	2	84414	..	..	33320	3545	685
„ Australia	3221	522	3743	..	6717905	5658884	70	..	6508	9688	1830	1318	3321
„ America	201	..	201	108390	356264	232751	390	2187	80000	..	26578	71494	87957
„ Africa	..	..	..	..	48194	70293	..	..	..	..	4	..	502
„ China	188	..	188	..	94897	160210	..	200	34400	..	2832	452	..
„ Singapore	4	..	4	..	46261	19432	271	..	..	..	25269	8405	..
„ Mauritius	75	28	103	..	59494	92231	..	..	..	..	..	..	..
„ Malta	..	..	..	..	94700	43295	..	..	..	..	..	..	..
Total export from 1st Jan. to Aug. 4th 1896	14586	561	15147	731093	67538732		23550	194667	1068250	457998	151313		195481
do 1895	43703	2602	46305	704034	61739301		20911	235296	928370	415310	173518		157175
do 1894	17272	465	17737	1632610	55190842		13738	188341	834701	297303	264545		170504
do 1893	38359	1735	40004	2560732	51695714		23792	230374	837964	314418	183453		231528

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's Fortnightly Prices Current, London, July 15th, 1896.)

	QUALITY.	QUOTATIONS.
ALOES, Socotrine ...	Fair to fine dry ...	44s a 100s
Zanzibar & Hepatic	Common to good ...	11s a 76s
BEES' WAX,		
Zanzibar & { White ..	Good to fine	£7 a £8
Bombay { Yellow...	Fair ..	£6 a £7
Mauritius & Madagascar..	Dark to good palish ..	£6 5s a £7
CAMPHOR, China ...	Fair average quality ...	120s
Japan ..	,, ,, ,, ..	127s 6d
CARDAMOMS, Malabar..	Clipped, bold, bright fine	1s 1d a 2s 8d
	Middling, stalky & lean	1s 5d a 1s 9d
Ceylon.—Mysore ...	Fair to fine plump ..	1s 8d a 3s 7d
	Seeds	2s 9d a 3s 2d
,, Tellicherry...	Good to fine ...	1s 8d a 2s
	Brownish ..	1s 3d a 1s 8d
,, Long ...	Shelly to good ...	1s 6d a 3s
,, Mangalore ..	Med brown to good bold	2s 4d a 3s 6d
CASTOR OIL, Calcutta..	1sts and 2nds ...	2½d a 3⅛d
Madras ...	1sts and 2nds ...	2¼d a 2¾d
CHILLIES, Zanzibar ...	Dull to fine bright ..	28s a 35s
CINCHONA BARK.—		
Ceylon ...	Ledgeriana Chips ...	1d a 3½d
	Crown, Renewed ..	2d a 4½d
	Org. Stem	1½d a 3d
	Hybrid Root ...	2¼d a 2½d
	Chip	1¼d a 2d
CINNAMON, Ceylon 1sts	Ordinary to fine quill ..	10½d a 1s 1d
2nds	,, ,,	9¾d a 1s
3rds	,, ,, ...	9½d a 11½d
4ths and 5ths	Woody and hard ..	8¾d a 9½d
Chips	Fair to good ..	3d a 3⅜d
CLOVES, Penang ...	Dull to fine bright bold	7d a 11d
Amboyna ..	Dull to fine ...	3d a 4d
Zanzibar and Pemba }	Good and fine bright .	2 1-16d a 2⅛d
	Common dull to fair ...	1⅞d a 2⅛d
Stems ..	Fair ..	¾d
COCULUS INDICUS ...	Fair	7s 6d a 8s
COFFEE ...		
Ceylon Plantation .	Bold to fine bold colory	110s a 118s
	Midding to fine mid ...	100s a 108s
	Low mid. and low grown	95s a 100s
	Smalls ...	90s a 94s
Native ...	Good ordinary ...	70s a 80s
Liberian ...	Small to bold ...	72s a 80s
COCOA, Ceylon ..	Bold to fine bold ...	53s a 71s
	Medium and fair ...	50s a 56s
	Triage to ordinary ...	20s a 50s
COLOMBO ROOT...	Fair to good ..	12s a 14s
	Ord. & middling wormy	9s a 11s
COIR ROPE, Ceylon ...		nominal
Cochin ..	Ordinary to fair	£10 a £15
FIBRE, Brush ..	Ord. to fine long straight	£10 a £24
Cochin ...	Ordinary to good clean	£12 a £17
Stuffing ..	Common to fine	£5 a £6 10s
COIR YARN, Ceylon ..	Common to superior	£12 a £26 10s
Cochin ..	,, ,, very fine ...	£12 a £34
do. ..	Roping, fair to good .	£11 10s a £15
CROTON SEEDS, sifted...	Fair to good	66s
CUTCH	Fair to fine dry ..	17s a 32s 6d
GINGER, Bengal, rough	Fair	16s
Calicut, Cut A	Good to fine bold ...	60s a 73s 6d
B & C	Small and medium ..	42s a 56s 6d
Cochin Rough...	Common to fine bold	32s 6d a 35s
	Small and D's ...	28s a 30s
Japan ..	Unsplit	14s a 17s
GUM AMMONIACUM ...	Sm. blocky to fine clean	17s a 36s 6d
ANIMI, Zanzibar...	Picked fine pale in sorts	£10 7s 6d a £13
	Part yellow and mixed	£7 17/6 a £10 10s
	Bean and Pea size ditto	70s a £7 12/6
	Amber and dk. red bold	£4 5s a £9
	Med. & bold glassy sorts	90s a 137s 6d
Madagascar ...	Fair to good palish ...	£4 8s a £6 15s
	,, ,, red ..	£5 a £7 5s
ARABIC E. I. & Aden ...	Ordinary to good pale	50s a 70s
Ghatti ..	Pickings to fine pale ...	25s a 75s
Kurrachee .	Good and fine pale	65s a 75s
	Reddish to pale selected	35s a 55s
Madras ...	Dark to fine pale	45s a 65s
ASSAFŒTIDA ...	Clean fr. to gd. almonds	40s a 70s
	Ord. stony and blocky	15s a 35s
KINO ...	Fine bright ..	£20 a £25
MYRRH, picked ...	Fair to fine pale ...	80s a 90s
Aden sorts	Middling to good ...	33s a 65s
OLIBANUM, drop ..	Good to fine white ...	35s a 60s
	Middling to fair ..	20s a 31s
pickings	Low to good pale	7s a 15s
siftings	Slightly foul to fine ...	9s 6d a 14s
INDIARUBBER, Assam .	Good to fine ...	1s 10d a 2s 3½d
	Common to foul & mxd.	3d a 1s 6d
Rangoon	Fair to good clean ...	1s 4d a 1s 11½d
Borneo ...	Common to fine	1s a 1s 7d

	QUALITY.	QUOTATIONS
INDIARUBBER, (Contd).		
Java, Sing. & Penang	Foul to good clean ..	1s 3d a 2s 3d
Mozambique {	Good to fine Ball ..	2s 2d a 2s 5d
	Ordinary to fair Ball	1s 2d a 2s 1½d
	Low sandy Ball	10d a 1s 1d
	Sausage, fair to good	1s 4d a 2s 5¾d
	Liver and livery Ball .	1s 3½d a 2s 2½d
Madagascar {	Fr. to fine pinky & white	1s 11½d a 2s 5d
	Fair to good black ...	1s 3d a 1s 10d
	Niggers, low to good...	10½d a 1s 6½d
INDIGO, E.I. ...	Bengal—	
	Shipping mid to gd violet	4s 6d a 5s 2d
	Consuming mid. to gd.	3s 9d a 4s 4d
	Ordinary to mid. good	2s 10d a 3s 8d
	Mid. to good Kurpah...	2s 6d a 3s 3d
	Low to ordinary ..	1s a 1s 6d
	Mid. to good Madras .	1s 4d a 2s 10d
MACE, Bombay, & Penang	Pale reddish to fine ..	1s 8d a 2s 2d
	Ordinary to fair ...	1s 2d a 1s 6d
	Chips and dark	1s
MYRABOLANES, Madras	Dark to fine pale UG ..	2s 6d a 4s 6d
	Fair Coast ..	4s 3d
Bombay ...	Jubblepore ...	3s 9d a 6s
	Bhimlies ...	3s 9d a 7s
	Rhajpore, &c. ...	3s 6d a 5s 6d
Bengal ..	Calcutta ..	3s 6d a 5s 6d
NUTMEGS—	64's to 57's ..	2s 11d a 3s 2d
Bombay & Penang	110's to 80's ..	1s 2d a 2s 10d
	160's to 130's ...	9d a 1s
NUTS, ARECA ...	Ordinary to fair fresh .	8s 6d a 12s 6d
NUX VOMICA, Bombay	Ordinary to middling ..	4s 6d a 6s
Madras	Fair to good bold fresh ..	6s a 7s 6d
	Small ordinary and fair	4s 6d a 7s
OIL OF ANISEED ...	Fair merchantable ...	7s 3d a 7s 6d
CASSIA ..	According to analysis..	4s 8d a 6s
LEMONGRASS ..	Good flavour & colour...	2⅜d
NUTMEG ...	Dingy to white	3½d a 4d
CINNAMON ...	Ordinary to fair sweet...	4d a 1s 3d
CITRONELLE ..	Bright & good flavour	1s 6d
ORCHELLA WEED—		
Ceylon ..	Mid. to fine not woody .	11s a 15s
Zanzibar. ..	Picked clean flat leaf ...	10s a 20s
	,, wiry Mozambique	15s a 17s 6d
PEPPER (Black)—		
Alleppee & Tellicherry	Fair to bold heavy ..	2¼d a 2½d
Singapore	Fair	2 5-16d
Acheen & W. C. Penang	Dull to fine	2d a 2⅜d
PLUMBAGO, lump ..	Fair to fine bright bold	15s a 17s 6d
	Middling to good small	3s 6d a 13s
chips ...	Dull to fine bright	1s 6d a 8s 9d
dust ...	Ordinary to fine bright	2s a 6s
SAFFLOWER ...	Good to fine pinky ...	85s a 90s
	Middling to fair ..	80s
	Inferior and pickings .	60s a 65s
SANDAL WOOD—		
Bombay, Logs	Fair to fine flavour ..	£30 a £50
Chips	... ...	5s a £3
Madras, Logs	Fair to good flavour ..	£30 a £50
Chips	Inferior to fine	£4 a £8
SAPAN WOOD, Bombay	Lean to good ...	£4 a £6 5s
Madras	Good average	£4 a £6 nom.
Manila	Rough & rooty to good	£4 10s a £5 15s
Siam	bold smooth	£6 a £7
SEEDLAC ..	Ord. dusty to gd. soluble	70s a 95s
SENNA, Tinnevelly ...	Good to fine bold green	6d a 8d
	Fair middling medium	2¼d a 5½d
	Common dark and small	½d a 2d
SHELLS, M. o'PEARL—		
Bombay ...	Bold and A's	£4 10s a £4 12s 6
	D's and B's	£4 5s a £4 15s
	Small	75s a 85s
Mussel ...	Small to bold ...	10s a 50s
TAMARINDS, Calcutta ..	Mid. to fine bl'k not stony	9s
Madras ...	Stony and inferior ..	6s a 7s
TORTOISESHELL—		
Zanzibar and Bombay	Selected	54s
	Small to bold dark ... mottle part heavy ...	17s a 23s
TURMERIC, Bengal ...	Fair	7s 6d
Madras ..	Finger fair to fine bold [bright	8s a 9s 6d
Do.	Mixed midlng.	7s a 8s
Do.	Bulbs	6s 6d a 7s 6d
Cochin	Finger	7s a 7s 6d
	Bulbs	5s 6d a 7s 6d
VANILLOES—		
Mauritius and } 1sts	Gd. crystallized 4 a 9 in.	17s a 32s
Bourbon ... } 2nds	Foxy & reddish 4½ a 8 ,,	11s a 15s
3rds	Lean and inferior ..	7s a 10s
Seychelles ...	Inferior to fine crystallized 3½ a 9 in.	8s a 31s
VERMILION ...	Fine, pure, bright ...	2s 8d a 2s 9d

THE

AGRICULTURAL MAGAZINE,

COLOMBO.

Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."

The following pages include the Contents of the *Agricultural Magazine* for August:—

Vol. VIII.] AUGUST, 1896. [No. 2.

SEASON NOTES FOR JUNE.

WESTERN PROCINCE.—A fairly good *yala* paddy harvest is expected; in some places crops have been slightly damaged by floods. The supply of fruit and vegetables reported good except in the Negombo district where they are scarce.

CENTRAL PROVINCE.—Paddy fields are being ploughed for maha sowing. Vegetables reported deficient in Nuwara Eliya.

NORTHERN PROVINCE.—Paddy lands are being manured and ploughed. There is a fall in the price of tobacco compared with last year. *Stock.* Cattle plague still prevailingin some parts of the Mullaittivu district.

SOUTHERN PROVINCE.—The area under paddy crop in the Galle district smaller than in the corresponding season last year. Condition of crop satisfactory. Fruit and vegetables plentiful, but jak and breadfruit are scarce. In Giruwa pattu of the Hambantota district, paddy sown on irrigated land promises well, but that on unirrigated land, though fair at present, will require rain. The food supply of the pattu at present is reported to be somewhat scanty.

NORTHERN PROVINCE.—Paddy harvest has commenced and is fair except in certain tracts of the Batticaloa district reported to be damaged by blight. Tobacco prices at Trincomalee reported to be better than last year.

NORTH-WESTERN PROVINCE *Puttalam District.*—Crop prospects fair except in the Puttalam Pattu, where nothing has been done for want of timely rain; prospects of fine grain crops moderate. Chilaw district yala crops are thriving.

NORTH-CENTRAL PROVINCE.—Paddy Crops being reaped in certain places and at others in various stages of growth. Gingelly crop been also being reaped. *Stock.*—Cattle plague still prevailing.

UVA.—Paddy in various stages, crops reported good. Fruit and vegetables scarce throughout the district. *Stock.*—Cattle plague in Wiyaluwa.

RAINFALL TAKEN AT THE SCHOOL OF AGRICULTURE DURING THE MONTH OF JULY, 1896.

1	Wednesday ..	·02	19	Sunday ..	·09
2	Thursday ..	Nil	20	Monday ..	·07
3	Friday ..	·03	21	Tuesday ..	Nil
4	Saturday ..	Nil	22	Wednesday ..	Nil
5	Sunday ..	Nil	23	Thursday ..	Nil
6	Monday ..	Nil	24	Friday ..	·30
7	Tuesday ..	Nil	25	Saturday ..	·70
8	Wednesday ..	Nil	26	Sunday ..	5·7
9	Thursday ..	Nil	27	Monday ..	Nil
10	Friday ..	Nil	28	Tuesday ..	·44
11	Saturday ..	Nil	29	Wednesday ..	Nil
12	Sunday ..	Nil	30	Thursday ..	Nil
13	Monday ..	Nil	31	Friday ..	·12
14	Tuesday ..	Nil	1	Saturday ..	·21
15	Wednesday ..	Nil			
16	Thursday ..	Nil		Total ..	2·55
17	Friday ..	Nil		Mean ..	·08
18	Saturday ..	·02			

Greatest amount of rainfall in any 24 hours on the 25th Saturday, ·70 inches.

Recorded by M. W. K. BANDARA.

THE INSPECTION OF MEAT.

BY G. W. STURGESS, M.R.C.V.S., &c., Government Veterinary Surgeon.

I.

From the close relationship existing between the diseases of human beings and animals—and from the fact that certain diseases can undoubtedly be communicated to man from animals—the question of the proper supervision of the animals intended for slaughter, and the thorough inspection of the flesh after death becomes of paramount importance. This can only be effectually carried out by killing the animals in public abattoirs or slaughter-houses. Here the animals can be inspected before slaughter, and the meat afterwards, before being passed over to the butchers and sold to the public.

With the private slaughter-house system it is practically impossible to carry this out however vigilant the inspector may be, as the animals are often slaughtered, cut up, and removed under cover of darkness.

PRIVATE SLAUGHTER-HOUSES.

Before granting a license to private persons to slaughter, the following rules should influence the decision of the sanitary authorities upon each application for a license, as regards the site and structure of the premises to be erected:—

1.—The site selected should not be within 100 feet of any dwelling-house, and should admit of free ventilation by direct communication with the external air.

2.—The places reserved for the confinement of the cattle should not be within 100 feet of a dwelling house.

3.—The slaughter-house should not be below the surface of any adjoining ground.

4.—No room or loft should be constructed over a slaughter-house.

5.—A good water supply must be provided.

6.—The slaughter-house should be well paved with asphalt or concrete, and laid with a proper slope or channel towards the drain, which should be properly trapped and covered with a grating, the bars of which should not be more than $\frac{3}{8}$ths of an inch apart.

7.—Provision for the effectual drainage of the slaughter-house should be made.

8.—No water-closet, privy, or cesspool should be constructed with the slaughter-house, neither should there be any direct communication between the slaughter-house and any stable, water-closet, privy or cesspool.

9.—Every lair for cattle in communication with the slaughter-house should be properly paved, drained and ventilated.

Distinguishing Characteristics of Flesh.

THE FLESH OF THE OX.

When freshly killed it should always be of a slightly florid hue on section, and of a firm and somewhat elastic consistency. It is moist when first cut, but rapidly dries on exposure, the colour at the same time brightens a little, consequently a fresh section should always be made each time it is examined.

To the hand the cut section should afford no evidence of soapyness or adhesiveness, neither should it be very cold or clammy. In beef there is no odour of any importance when healthy, the causes of odours we shall notice by and by. In certain parts of the body the flesh presents what is known as a "marbled" appearance, that is due to the presence of fat, intermingled with the muscular tissue.

The carcase should set firmly, and become fairly dry in a few hours after death. This applies more to temperate countries where the meat is kept several days; in the tropics for obvious reasons it is necessary to consume the flesh very soon after death.

In animals a few months old the flesh is pale and tender; as age advances it becomes darker, firmer, and has a greater tendency to dry.

Healthy fat should be of a pale yellow colour and moderately firm. It is sometimes quite white or may be of a deep yellow tinge depending largely upon the food. It is usually very pale in cattle that have been fed upon corn and hay and generally very firm, also it is sometimes white in young bulls and American cattle.

YELLOWNESS.

The fat of some breeds of cattle is naturally yellow, particularly Jersey cattle. If the colour is exaggerated it is due to rich feeding on oilcakes or to jaundice. If due to jaundice the flesh will also be dark and soapy.

Distinguishing Characteristics of the Flesh of Various Animals.

Only a brief glance can be given to this part of the subject, as various technicalities are unavoidable and only capable of being applied when examining whole carcases, and which would be unintelligible to non-professional readers.

THE BULL.

The neck is thick and well developed and comparatively short. The fat on the breast-bone is coarse, hard, and in large quantities. The arms are well developed, and the tissues generally are coarse. There is a slight odour sometimes in very old bulls.

THE COW.

The udder if present marks the carcase of the cow; it is generally removed, but the line of section is nearly always distinct; the surrounding fat is thin and in small quantities. The bones of the pelvis are finer, but the diameter of the pelvic cavity is greater than either the bull or bullock.

THE SHEEP.

Mutton is much paler than beef and not so firm in consistence. The fat is in all cases firmer and whiter in colour, and it is distributed widely over the body. The bones are the same shape as of the larger ruminant but smaller in size. Mutton has a slight peculiar odour.

The flesh of the lamb is very pale and tender, that of the ram is red in colour, almost as red as beef, and it has often a pronounced disagreeable odour.

THE PIG.

The flesh is paler and less firm than that of the ox, especially in young pigs; it sometimes becomes dark in old pigs, especially boars. The fat is more lardy and softer than that of any other animal. The skin is a distinguishing feature, and there is always a peculiar odour, especially marked in the boar which is considerably modified by castration a few months before slaughter.

THE GOAT.

Goat's flesh more closely resembles that of the sheep; it is usually darker, dryer and firmer in consistency. The fat is rather scarce, and there is always a distinguishing odour.

(*To be continued.*)

IMPORTANT LOCAL DECISION *RE* ADULTERATED MILK.

The following reports are taken over from the *Ceylon Observer* :—

A Case of Adulterated Milk.—The case instituted by Color-Sergt. Arnold Hill, against a Sinhalese milk vendor, for selling adulterated milk containing 72 per cent. water, was taken up for hearing before the Police Court yesterday afternoon. Amongst the witnesses examined for the prosecution was Col. Tidy of the Lancashire Regiment. The further hearing was postponed till Monday next, when the Public Analyst, Dr. H. M. Fernando, will be examined for the prosecution.

The further hearing of the case instituted by Col.-Sergt. Hill against his milkman, for supplying adulterated milk, was taken up this afternoon before the Police Court. Dr. H. M. Fernando, the public analyst, on being examined stated that he analysed a bottle of milk sent to him by Col. Tidy on the 27th June last. The bottle contained 70 per cent of milk and 30 per cent of water. This milk was not injurious to health. It did not contain added sugar or other foreign matter. In cross-examination he stated that pure milk contained 87 per cent of watery matter, and other parts consisted of sachcharine, nitrogenous, and inorganic substance. The complainant on being recalled stated that he paid the milkman the value of this milk at the end of the mouth, long after he was aware that the milk was adulterated. The Magistrate found that no criminal charge could be framed against the accused, as the milk was not injurious to health, and as the value of the milk had been paid long after the complainant became aware that the milk was adulterated. The accused was then acquitted and discharged.

OCCASIONAL NOTES.

We would draw attention to another letter on the subject of Coconuts by the well-known agricultural correspondent "B," and regret that it reached us too late for insertion in our last issue.

We note with pleasure that it has been decided to hold an Agri-Horticultural Show at Nuwara Eliya next year, and that a similar project is talked of in connection with the town of Matale. The more the better, say we. Why not a Show in Colombo also?

H.E. the Governor paid a visit to the School of Agriculture on the 15th July, and inspected the various branches of the institution.

A nice crop of fruit is just now maturing in the vineyard attached to the School of Agriculture. The present month will complete the first year of the experiment in Viticulture, which has been an important one for the colony. We learn that three gentlemen (Messrs. J. H. Barber, H. L. Daniel, and R. Pieris) are cultivating improved varieties of grapes on the "Extensive System." With better conditions as regards soil-moisture than obtain at the School of Agriculture premises, we shall expect to hear of good results.

The present issue contains the first part of Mr. Sturgess's contribution on "The Inspection of Meat," which, when complete, should form an instructive paper.

A new interest has sprung up in Apiculture and Sericulture, and a few enterprising spirits are working at these interesting if not very remunerative industries. We note that special prizes are offered for exhibits in illustrating both bee-keeping and silk-worm rearing at the forthcoming Agri-Horticultural Show, and trust that by that time the experiments referred to will have shown that the natives could profitably work at these home industries.

We have received a copy of "The Life of Ehelapola" by Mr. T. B. Pohath Kehelpannala, late a student of the Colombo School of Agriculture. The pamphlet forms an interesting character sketch of a striking personage who flourished in the last days of the Kandyan dynasty.

FOREST LAWS OF OF CEYLON.—II.

The next Ordinance which principally affected the Forest Laws of Ceylon was the Ordinance No. 6 of 1878, which was necessitated owing to decisions of the Supreme Court, which had shown that the law as it existed in 1878 was quite inadequate for the protection of timber trees grown in Crown forests. There were two processes by which Crown forests had been denuded of the best part of their valuable timber. The one was the illicit felling of timber for the purposes of sale and removal; the other was the illicit cultivation of Crown forests for the purpose of temporary crop, during the process of which cultivation valuable trees were burnt and destroyed. Illicit felling for the purpose of sale or removal was punishable under the existing law; but the Supreme Court held that where the timber was destroyed as part of the process of cultivating land, such destruction was not punishable under the then existing Timber Ordinance No. 24 of 1848. [P.C., Anuradhapura 8,830. Ram. (1877) 23; P.C., Kegalla, 41,512. Ram. (1877) 69.] Consequently it became necessary in order to protect Crown forests, to make provision that the unlawful destruction of timber should be punishable for whatever purpose it might have been destroyed. The principal object of the Ordinance No. 8 of 1878 was the enactment of such a provision. Besides the object just mentioned there were one or two important alterations in the law. One was that the definite expression "valuable timber" be no longer used, the precise trees to which the Ordinance applied being specified in the Schedule. Another important alteration made the law applicable to the destruction of saplings as well as timber trees. This Ordinance also limited the punishment by fine and imprisonment for offences against the Ordinance.

A period of seven years elapsed when the Ordinance No. 10 of 1885 was passed, the principal Ordinance under which our forests are regulated. It is intituled "An Ordinance relating to Forests and Waste Lands and to the felling and transport of timber." This Ordinance is based chiefly on the Burmrh Forest Act. An expert from the Indian Forest Department was sent out to Ceylon—a Mr. Vincent—who after spending several months in examining the Forests of Ceylon made a very exhaustive report upon the subject. The result of that report was the Ordinance No. 10 of 1885.

The Ordinance comprises a vast number of details, some relating to the whole Island, and some relating in different ways to different parts of the Island. In order that the question may be properly dealt with, the Ordinance provides that the special circumstances should be dealt with by means of rules to be made to suit the varying circumstances of each district.

(To be continued.)

THE QUANTITY OF MILK REQUIRED TO MAKE A LB. OF BUTTER.

Mr. Huxton in his article on Dairy Husbandry in the Agricultural Cyclopœdia refers to the churning of 100 gallons of milk from Fifeshire cows in midsummer and obtaining $27\frac{1}{2}$ lb. of butter, which is at the low rate of 1 lb. butter to every 29 pints of milk. Mr. Aiton who has written on the Dairy Husbandry of Ayrshire reports the milk of Ayrshire cows as ordinarily yielding 1 lb. of butter to 20 pints milk. The following are other instances: Mr. Telfer's ordinary yield from Ayrshire cows was 1 lb. for $20\frac{1}{4}$ pints, when the milk was richest it gave 1 lb. per 18 pints, and when poorest 1 lb. per 24 pints.

Mr. Williams, Cork Co., in one of the most fully detailed accounts that exists of dairy experience stated that from well-fed and well-bred Irish cows he got 1 lb. butter from $22\frac{1}{2}$ pints of milk in summer, and 1 lb. from $19\frac{1}{2}$ pints in the winter, for the whole year he got 1 lb. from $21\frac{1}{2}$ pints.

The late Mr. Horsfall of Burly Hall near Otley found he got 1 lb. from 21 to $18\frac{2}{3}$ pints milk. The average yield of Mr. T. Scott's English dairies, quoted some years ago before the Royal Agricultural Society, was at the rate of 1 lb. butter to nearly 25 pints. These differences in the butter yield are of course traceable to original differences in the quality of the milk, due to differences of breed and of individual character; on differences of the period after calving and the age of the animals: and on differences of feeding.

Prof. Long referring to this matter writes: "We have of late been startled by extraordinary records of butter produce from America, where Jersey cows have been cultivated and stimulated to an almost incredible productiveness . . . . We fear agricultural maxima have little influence on agricultural averages; and while we do not refuse our belief to even the marvellous stories told of Eurotas and other extraordinary American Jerseys, we fear them in ordinary experience of the larger breeds of dairy cows in this country, 1 lb. of butter from 20 to 21 pints of milk (about $2\frac{1}{2}$ gallons) is more nearly the average.

In his interesting paper on Milk and Milk Products in India, Mr. James Mollison, Superintendent of Farms in the Bombay Presidency, states as the result of his observations at the Poona Farm during the years 1891-93, that with cows $13\frac{3}{5}$ pints and with buffaloes $8\frac{4}{5}$ pints of milk were required respectively for producing one pound of butter. These results were no doubt obtained with the use of the cream separator

The following tables are taken from a report by the Director of the Bombay Agricultural Departments on the dairy experiments which were conducted in that Presidency. The experiments were initiated by Mr. Howman of the London Dairy Supply Company, and show the results in butter production (1) by the native method of butter-making and (2) by the use of the cream separator:—

Table showing quantities of cow milk in pints and ounces required to prodnce 1 lb. of butter.

Place.	By Native Method. Quantity of Milk. Pints.	Ounces.	With Separator. Quantity of Milk. Pints.	Ounces.
Calcutta	22	$13\frac{9}{11}$	17	$2\frac{10}{17}$
,,	—	—	13	12
Bankipore	—	—	16	$19\frac{1}{5}$
Nadiad	14	$14\frac{2}{5}$	16	$7\frac{1}{5}$
Etawah	22	8	19	12

Table showing quantities of buffalo milk required to produce 1 lb. of butter.

Place.	By Native Method. Quantity of Milk. Pints.	Ounces.	With Separator. Quantity of Milk. Pints.	Ounces.
Poona	16	—	9	$2\frac{3}{7}$
Bellary	9	$9\frac{1}{2}\frac{3}{7}$	8	$19\frac{3}{5}\frac{7}{7}$
Bankipore	—	—	10	$7\frac{3}{7}\frac{1}{5}$
Nadiad	8	$6\frac{2}{5}$	8	$6\frac{2}{5}$
Etawah	8	—	10	—
Saharanpur	—	—	11	$10\frac{2}{5}$
	—	—	11	12
	—	—	12	8

Mr. Mollison's average of $13\frac{3}{5}$ pints per lb. of butter is a high one, but it must be remembered that the milk came from cattle well fed and housed, and treated according to the most approved methods of dairy management. It would hardly be fair to take this as the average for an Indian cattle. The cows kept on the Poona farm are also well selected animals of the best milking breeds, such as Sind, Gir, and Aden. In the article on Milk and Milk Products by Mr. Mollison—the first part of which appears in this issue—will be found a comparative analyses of the milk of the Indian cow, the English cow, and the buffalo, which show in the percentages of fat how it is that while the average quantity of cows' milk required for 1 lb. of butter is in England about 20 pints, in India it is about 14, and the quantity of buffalo milk is about 9 pints.

NOTES FROM WESTERN INDIA.

The land available for cultivation in and near the city of Bombay is very limited, but the little that is available is made very good use of. A small field or garden in the vicinity of the city is looked upon as a very paying concern, for the produce finds a ready market. The crops grown in this neighbourhood are paddy, Indian corn, pulses, vegetables such as knolkhol, radish, turnips and bringals, fruits such as mangoes, oranges and custard apples, and fodder crops including lucerne and ramnah grass.

The paddy cultivated is very little, as the staple food is wheat which is grown at higher altitudes far away in the interior. Wherever paddy is grown, it is always first sown in nurseries and then planted out when the seedlings are about three or four weeks old.

Indian corn is sown on dry lands early in June, so that the plants may grow during the rains and the cobs mature in fairly dry weather. The cobs are gathered before the seeds are fully ripe and are eaten roasted or boiled, some of the best plants being allowed to run to seed.

The rotation of crops practised here is worthy of notice. In a field of maize, for instance, and leguminous crop such as beans or gram is first grown, and after it is gathered, the land is tilled and manured, and then the maize is sown which, in turn, is followed by a leaf crop. Then the round begins again with the leguminous crop, and the land is not allowed to lie fallow except for a few weeks just before the maize is sown. In this way while the fertility of the land is preserved, the greatest possible profit is obtained from it. The maize crop which succeeds the bean or gram is also benefited by the nitrogenous matter left in the soil by the latter.

Allied to rotation of crops is the system of growing mixed crops by which is meant raising crops of two or more kinds simultaneously on the same land. The Indian ryot fully recognizes the benefit of this method of culture and makes up for the deficiency in mauring by adopting it. At the Poona Farm I noticed that Mr. Mollison had given his sanction to this method by growing a mixed crop of bajiri and dhall in a few plots. The dhall was planted in lines 4 feet apart, and 3 rows of bajiri sown one foot apart were grown between every two rows of dhall. The special benefit of growing a papilionaceous plant such as dhall side by side with a cereal will be manifest to every one who is aware of the fact that the former class of plants can asssimilate the free nitrogen of the air by means of bacteroids contained in the tubercles attached to their roots.

Cattle and horse droppings are used as manure in the form of dry cakes or "bratties" which are often spread on the land and burnt before the rains, the ashes being ploughed in soon after the burning. This practice, although it has the advantage of destroying the grubs and maggots which breed in the dung, has the serious drawback of being attended with the loss of the organic portion, especially the nitrogenous part which the farmer can ill afford to lose.

Bratties are often used as fuel, and where this is the case the ashes from the kitchen ought to form a valuable manure as it contains the potash, phosphates, and certain nitrates and other mineral ingredients of the dung.

Wool refuse is a favourite manure especially for maize.

India can boast of a greater variety of native agricultural implements than Ceylon. The ryots carry on cultivation on an extensive scale, especially on dry land. With them necessity has been the mother of invention as regards their implements. They cannot afford to loiter over about with unsuitable tools when they have vast tracts of land to be operated upon in a short space of time, and by the mere handful of labourers at their disposal. Driven to their wits' end by the force of circumstances they have invented a variety of implements specially suited for different operations. While some of these bespeak a rather high degree of inventive skill and ingenuity, others are of a primitive kind. I shall only select a few of these for consideration here.

The Indian plough is very like the native plough used in Ceylon, but the share is thicker and stronger and goes a little deeper.

As an example of the implements of the primitive type may be mentioned the huge log of wood drawn by bullocks and used as a sort of harrow or clod-crusher and leveller after dry-ploughing.

Others, however, are of an improved or better type such as the bullock rake, bullock hoe and the seed drill. The bullock rake and the bullock hoe as their names imply are drawn by bullocks. The former is used like an ordinary spiked harrow, and the latter is used for weeding between rows of plants when they are sufficiently wide apart to admit of the bullocks walking between them without trampling the plants.

The seed-drill called *pamal* or *thiffen* by the ryots is a really useful implement and is well worth introducing into Ceylon. It is said that it answers almost as well as the English seed drill. Its price is only about five rupees.

But since of late a cheap and very convenient sowing box or machine has been invented in England, which it would be more advantageous to introduce to Ceylon. Sowing is so irregularly done in our Island at present, and so large a quantity of seed is wasted, that a cheap but efficient seed drill or sowing machine is a great desideratum and would prove a great boon.

E. T. HOOLE.

SERICULTURE.

It must be admitted that we have very few industries in the Island which are capable of giving employment to the native agriculturist and especially to the members of his family during the time they have little work in the paddy-fields. The Sinhalese cultivator is frequently accused of apathy and gross laziness, but the average tiller of the soil cannot be expected to possess the knowledge and resources necessary for experiments in connection with new industries with a view to their adoption. No one will, however deny, that when he is instructed in the details of an industry that is likely to bring him an income and will not interfere either with the cultivation of his field or with his liberty as a proprietor, he is not only ready to adopt them, but is capable of carrying on the work with success. Under these circumstances it surely behoves those who have the welfare of the country at heart to experiment in connection with and popularise such industries as will give employment to and draw forth the latent energies and capacity of a large number of the rural population. The improvement of the villager's condition cannot be effected by the introduction of any industries which require large capital and which will necessarily involve factory work and cooly labour. These will benefit the larger capitalists but the material and moral welfare of the agricultural masses can only be improved by providing them with work that will not necessitate the sacri-

fice of either their independence or the neglect of their holdings, however insignificant these may be. They must be encouraged to depend on themselves and work for themselves and not to work for others to the neglect of their land; and they must not be encouraged to congregate in manufacturing centres, where with busy surroundings, keen competition and undesirable associations they begin to feel discontented, a condition which generally leads to much trouble. Under these circumstances the importance of home industries cannot be over-valued. Sericulture or the rearing of silkworms may prove to be one of the industries adapted to the peculiar circumstance of the villagers. We say "may," because there are industries which though they appear likely to be suitable, will eventually be found to contain some element which makes it impossible for the people to carry it on with success. This point can only be satisfactorily settled by one or more experiments, and there is no reason why such trials should not be undertaken in Ceylon.

Broadly speaking there are two kinds of silkworms, the domesticated or the mulberry silkworm, and the wild or the uncultivated silk-worm. The domesticated silk-worm feeds only on the leaves of the mulberry tree and hence for its rearing the cultivation of the mulberry plant is necessary to give the insects a proper supply of food. The mulberry grows well even in the lowcountry here, but it is doubtful whether it would thrive well when grown on a large scale. Hence, in any experiment in sericulture it might be as well to first find out what amount of success can be obtained with the wild silk-worms.

We find in Ceylon a few species of moths that produce cocoons of a more or less coarse texture, but so far none of these have been found to be of much practical use. In India, out of a large number of species of wild silk worms, three have come to prominent notice as being more or less successful producers of cocoons. These, as will be seen, are likely to prove successful in Ceylon, especially as the leaves on which they feed, or on which they could be fed, are derived from plants and trees that we commonly meet with in the Island. The three important varieties of wild silks are known as the Tusser, the Muga and the Eri Silks.

It may be mentioned here in passing that the life of a silk-producing moth has four stages. The egg, otherwise called the "seed" by silk raisers is the first stage. An ounce of eggs will contain from 30 to 50 thousand. A single female moth produces from three to five hundred eggs on an average.

The second stage is that of the larva or the worm. The worm goes through generally about four stages of moults, or it may be said in its growth to cast its skin at four periods. The first moult generally takes place in five to six days, the second four to five days from the first, the third and the fourth each about four to five days; after the final moulting the worm turns into the chrysalis stage in about nine days. As a matter of course these periods vary greatly according to climate and species, but the above will furnish some an idea of the life history of the insect. Before each moult the worm generally fasts for a day or two, but in the interval it eats voraciously, and especially during the last period of its existence, and hence a silk raiser must be prepared to supply the necessary food to the insects at these stages. The spinning of the cocoon usually occupies from three to five days, and finally the insect turns into the chrysalis. During the chrysalis stage there is a suspension of animation. The chrysals bursts in from two to three weeks and the moth emerges. The last stage is that of the moth. The male moth has broader antennae or feelers and is more active than the female. Some hours after emerging out of the cocoon the female moth begins to deposit its eggs. The life of a moth usually extend to four or five days, but frequently to a fortnight or even longer.

W. A. D. S.

(To be continued.)

HOMCO MANURE.

We have been favoured with samples of this manure prepared by the Hull Oil Manufacturing Co., Ld. The two samples sent us are guaranteed to contain $6\frac{3}{4}$ to 7% ammonia, for which the present quotation is £3 5s. per ton in double bags f.o.b. London, for either the rough or finely-ground quality. To quote from the booklet which accompanied the samples: Homco is a vegetable manure meal manufactured from rape and other oil seeds by a patent process whereby the oil is thoroughly extracted leaving a soluble meal rich in ammonia. It is manufactured in three qualities, containing $5\frac{3}{4}$%, $6\frac{1}{2}$% and $7\frac{1}{2}$% of ammonia respectively; these percentages being always guaranteed. Among other advantages, it is claimed that it does not force the growth of plants to an undue and harmful extent, that it opens and lightens stiff lands and increases the retentive properties of sandy soils for manures and water, while at the same time it is not washed out by rain. As rape seed is one of its ingredients, it is said to be a preventive against wire worm and possibly of other ground pests. The analyses given of the manure have been made by Dr. Bernard Dyer, who remarks on one of the samples: "This is an excellent rape meal for manurial purposes. It is exceptionally rich in nitrogen (equal to over $7\frac{1}{2}$ of ammonia) and has the manurial advantage of having had nearly all its oil extracted, so that it will the more readily decompose in the soil."

MILK AND MILK PRODUCTS.

(By Mr. James Mollison, Superintendent, Government Farms, Bombay.)

The milk of neat cattle varies considerably in composition. Certain breeds yield richer milk than others. Excepting Channel Island cattle, all milk breeds of Europe yield milk which is poor in quality than the average of Indian cows. The average yield of selected Indian cows is much less than that of good specimens of any imported milch breed. Choice specimens of Jersey or Guernsey cows yield 30 lb. or more per day of rich milk, whilst Holstein and Shortham cows have each a record of over 70 lb. per day, though in quality the milk is poor. The yield of Indian cows surely exceeds 20 to 25 lb. per day.* Twelve to 16 lb.

* In reckoning quantity from weight of milk, the weight of one imperial quart (40 oz.) is taken as $2\frac{1}{2}$ lb., thus 20 lb., 25 lb. and 16 lb. will respectively correspond with 8, 10 and $6\frac{2}{5}$ quarts or again with $12\frac{4}{13}$, $15\frac{5}{13}$ and $9\frac{11}{13}$ Ceylon bottles of 26 oz. respectively.—Ed, *A.M.*

more nearly, however, approximate to the average of good cows in full profit. Buffaloes on an average give considerably more than cows in India, and their milk is also richer. Under skilful management there is no reason why the milk breeds in India should not be very much improved. It is quite within the bounds of possibility to breed up Indian buffaloes to become one of the best butter-producing breeds in the world. The best results respectively from a buffalo and a cow during the years 1891-93 on the Poona Government Farm are tabulated below:—

	Number of days in milk.	Total yield of milk.	Number of days dry.	Value of milk at current market rates.
Buffalo...	459	6,669 lb.	127	R417
Cow ..	471	5,024 ,,	44	335

N.B.—Giving 1 lb. butter for 11 lb. and 17 lb. milk respectively for buffalo and cow.

The comparative richness of milk may be gauged by the following analyses:—

		Average composition of milk. Indian cow.	Indian buffalo.	English cow.
	Water ...	86·13	82·05	87·20
Solids.	Butterfat ...	4·80	7·98	3·70
	Casein & Albumen	3·03	4·00	4·00
	Milk Sugar ...	5·34	5·18	4·40
	Ash ...	·70	·79	·70

(To be continued.)

Correspondence.

(*To the Editor, "Agricultural Magazine."*)

30th June, 1896.

Dear Sir,—How frightfully behind the times I am. I have only just read the letter of "Cocopalmist" dated the 18th March! It is cheering to find my old friend as assiduous an agriculturist as he is of Tamil Literature.

He writes enquiring whether a statement which appears in pp. 72-73 of "All About the Coconut Palm" which he quotes at length is true. My experience confirms it. If he will call over to see me I will shew him the hollow cylindrical tree, the tree with the whole stem less a small portion of it destroyed, the barkless tree and the tree with almost the whole bole devoid of roots, growing and bearing well. The writer of the letter he quotes from says that as coconut trees have no bark (is this so, and what is the outer covering of the stem which peels off in disease?) planters cannot force them into bearing by ringing the bark. To force a barren or badly bearing tree into fruitfulness, burn rubbish round the stem. The bark will in time peel off and the tree will be exceedingly fruitful. Another "dodge" is to set fire to the top of a coconut tree, the result is the same.

I wish very much to see the plantation with 40 trees to the acre which causes amusement to neighbours and yields from 200 to 800 nuts per tree per annum. The amusement and the field must both be very gratifying to its proprietor. In answer to my friend's concluding query, I must honestl nfess myself a sceptic.

That individual trees bear at the rate of 200 to 300 (not 800) one can believe; but to be asked to believe that the trees of a whole plantation bear at this rate is an over-draft on one's credulity.

Now as to the number of branches on a full-bearing coconut tree. Some authorities in "All About the Coconut Palm" say the tree throws at a spathe once a month, others every fotringht. There are certainly more than 12 bunches on a heavily-bearing tree, and they correspond with the branches from 24 to 36, but how is it that at every bi-monthly picking two bunches from each tree is the rule and three the exception? If a twelvemonth elapses between the bursting of the flower spathe and the picking of the ripe fruit, a tree must either have 12 bunches or nuts must ripen in 6 months! "Cocopalmist" says the plantation he writes of bears 36 bunches per tree. Do the trees yield six bunches at each bi-monthly picking?—Truly yours

B.

GENERAL ITEMS.

Tape-worm in calves is a common and troublesome experience with stock-owners. Veterinary Surgeon D. Hutcheon of the Cape referring to it says:—"There are several medicines which destroy or expel tape-worms. Turpentine, a tablespoonful mixed with a teacupful of raw linseed oil. Powdered sulphate of copper, 40 grains (half a teaspoonful) mixed with ten ounces or a breakfast-cupful of water. Cooper's powder, one teaspoonful, flowers of sulphur seven teaspoonfuls, mix thoroughly and give a teaspoonful of the mixture. The liquid extract of male fern, a teaspoonful, mixed in a little oil. These doses are for calves about 3 months old; older calves may get a little more, and younger ones a little less. The dose should be given in an empty stomach after a 12 hours' fast at least, and a longer fast is better if the calves are not too weak.

A correspondent of the *Cultivator* and *Country Gentleman* advises anyone having a cow with the habit of holding up her milk to give a sufficient quantity of grain usually fed to keep her busy for the time required to milk.

A cow suffering from inflamed udder should be milked *thoroughly* three or four times per day; under no circumstances should the udder be full and distended any length of time. For an inflamed and swollen udder foment frequently with hot water and apply vaseline or lard. Another remedy, highly recommended, is a mixture of sufficient cow's milk with as much salt as will make a thin paste; this should be used to anoint the udder four or five times per day.

There is now on view, at Bombay, a poultry farm—started apparently with the object of popularizing a certain make of incubators—in which some 6,000 eggs are being hatched.

The fodder grass cultivated last year at the Seebpore Experimental Farm were *sorghum*, *reana*, and guinea grass. *Sorghum* and *reana* have been grown for many years on the Farm, and found to yield a profitable outturn. Last year *sorghum* was grown on a small area (15 cottahs), and the yield of grass in two cuttings amounted to 16,893 lb. per acre. *Reana* was raised on 10½ cottahs of land; it yielded three cuttings, the outturn

amounting to 19,621 lb. per acre. An area of 12½ cottahs was newly planted during the year with guinea grass. The crop shows a vigorous growth, and promises to yield a heavy outturn for several years. The whole of the fodder raised on the Farm was fed to farm cattle.

Mr. John Hughes, the well-known analytical chemist, referring to his tour in Ceylon, says:—I was very much astonished at the small value apparently attached to the use of burnt lime from coral or from some of the numerous local deposits of magnesium lime stone, which very frequently occur in irregular masses interspersed among the prevailing granitic formations of the Island. At home the value of lime upon all arable soils is so fully recognised by practical agriculturists, that it would be unnecessary to enter at any length into a discussion of its merits . . . . . Lime is a necessary constituent of all permanently fertile soils, for it is a requisite element of the ashes of plants. It assists in rendering both the organic and in organic portions of soils available as plant food. On all flat land rich in organic vegetable remains, lime will be found especially valuable for improving the physical as well as chemical condition of the soil."

Dr. Watt writing about tea-blights refers to the part played by white ants in spoiling the tea plant. He believes that no tree is absolutely proof against this destructive pest, and that it is certain that if it does not attack trees while they are living, it often so does as soon as they are dead Excessive pruning, as a common cause of the white ant pest, is dwelt upon with proper emphasis.

A late member of the Indian Civil Service writing on the Salt monopoly says:—"The masses consume far too little salt owing to its dearness, and give none to their cattle; hence, most doctors agree, the great liability to zymotic and other diseases among men, and to murrain among cattle . . . . Salt is the basis of most important chemical manufactures, which cannot be carried on in the Empire under the present system with success."

It is proposed to confer additional powers on District Boards in Bengal, the necessary expenditure of enforcing which is to be drawn from the Road Cess. These Boards will thus be empowered to establish and maintain Veterinary Dispensaries for the reception and treatment of horses, cattle and other animals, to appoint and pay qualified persons to prevent and treat diseases of horses, cattle and other animals and to provide for the improvement of the breed of horses, cattle, &c. The *Indian Agriculturist* of May last is not greatly in favour of the new measures proposed, believing that the amount of good that will be ensured will be disproportionate to the expenditure incurred.

We hear of Ramie fibre being largely cultivated in Java for export to Singapore, and that European merchants are said to favour its extension by freely giving advances to growers, several of whom have also been provided with working capital.

Veterinary Captain Pease of India has discovered the fact that the death of cattle due to eating Jowari *(Sorghum vulgare)* at certain seasons, especially during droughts when the plants become stunted, is due to large deposits of crystalline nitrate of potash found in the stalks.